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CONDUCTED
BY W. NEWTON,
CIVIL ENGINEER AND MECHANICAL DRAFTSMAN.
(Assisted by several Scientific Gentlemen.)

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 - I. Perkins's mode of Heating Buildings; Cowper's Printing Apparatus; Hale's Propelling Machinery; Drake's Tanning Apparatus; Gray's Apparatus for Sheathing Ships; and Wilson's Machine for Preparing Rice.
 - III. Garsed and Robinson's Heating Apparatus; Gibbs and Chaplin's Improved Carriage; Jellicorse's Spinning Machinery; and Tyzack and Company's Improved Windlass.
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No. VII.

[SECOND SERIES.]

Original Communications.

**ART. I.—ON PROTECTING THE GENIUS AND INDUSTRY
OF THE BRITISH MECHANICS.**

To the Editors of the London Journal of Arts, &c.

~~GENERAL~~ Amongst the many objects of internal improvement, to which the attention of Government may, in a state of profound peace, be advantageously directed, there is scarcely one which so justly challenges a decided consideration as the means by which the mechanical talent of the community may be most effectually and beneficially exerted. A state of war is not favourable to internal and systematic ameliorations. The best disposed and most enlightened administration will have, during the pressure of foreign conflict; its energies necessarily and exclusively directed to the continually varied and mighty events, which, in their immediate or remote consequences, in-

volve the destinies, or even shake the foundations of the most powerful empires.

During such a period the revenue of a country is raised upon objects which readily present themselves to financial acumen and tact, rather than upon a principle of investigation of the most efficient means by which the resources of the nation may be connected with individual prosperity. The consequence is, that war is doubly oppressive upon a civilised country, although it be preserved from its immediate horrors and devastations. The taxes must be raised upon the ingenuity and labour of the community, whilst that very talent and industry have been left without adequate protection and encouragement from the Government.

The state of settled peace, which we have for years enjoyed, has afforded various administrations the opportunity of earning renown far beyond that of the laurelled victor, by gradually and systematically improving various parts of our internal economy, to the great satisfaction of reasonable men.

But there is one most important and absolutely necessary amelioration, to which by some fatuity the attention of Government seems scarcely to have been publicly called, although there is none that can interest the public more universally. I allude to the great improvement which would accrue to the condition of the mechanical and inventive portion of the community throughout this extensive empire, by giving to talent and industry an entirely different protection from what is received under the present system of granting Chancery Patents for inventions.

The oppression and inefficacy of this system are incalculable; as it regards the rights and just claims of individuals, it is a system of mere rapine and extortion, and

what is worse, of absolute insecurity and heart-rending uncertainty to the patentee, after he has submitted to the excessive cost in purchasing an exclusive right, which he may probably be ruined in attempting to maintain.

As the system respects the public, it sits brooding like a *horrid incubus* over the talent, energy, industry, and enterprise of the thousands and hundreds of thousands, who form the mental, mechanical, and operative strength of this vast community.

As a source of revenue, there is not a single branch or mode of abstraction from the means and labour of the people so little available to the public treasury, as is the amount of fees and perquisites (enormous as they are) which is paid, from presenting the petition and affidavit of a new invention, up to the sealing and delivery of that Chancery humbug* called a Patent, for the *security* of the invention.

In vain, does theoretic science extend the human faculty; in vain does practical experience linger for the moment when it may exert itself for the exclusive profit of its possessor; in vain does patient industry, united to talent, hope for the means of successfully and securely prosecuting the labored improvement; *they are not within his reach.*

From three to nearly four hundred pounds is to be paid for protecting the invention, distributed in innumerable fees of office, before patents can be obtained for England, Scotland, and Ireland. Need I say, this presents an impassable barrier to the developement of genius?

* I need not crave pardon for the use of that pithy although inelegant term, humbug, as it has been long a parliamentary phrase, both in the Corinthian and Doric house. I apprehend in the next *good* Dictionary to be published, we shall have the word inserted, *naturalis et indigens*, with its popular parliamentary, political, and philosophical signification.

Few are found, that will make the necessary enormous advance on behalf of a needy projector, without full information and knowledge of the invention; that information cannot be given without danger, and probable loss of the invention communicated. Thus, thousands of useful inventions are silently entombed with their possessors, the progress of art and practical science is immeasurably impeded,—talent and genius are without adequate encouragement,—the strength, industry, and activity of the country is proportionately depressed, and finally, the revenue, which might be raised with reciprocal advantage to government and to the people, is lost to the treasury.

And all this mass of unlimited evil and oppression is permitted—for what? That a few officers may have their exorbitant fees for doing nothing, and that a system, which originated in the worst and most arbitrary period of our history, may be continued.

Surely it is time for a wise and politic government to exert its powers, and present a remedy for this system of folly and indescribable evil.

A more particular detail of the charges and effects of this absurdly called protection, and some suggestions as to the nature of an efficacious remedy, will form the subject of a future communication.

I am, Gentlemen, &c.

“VINDICATOR.”

ART. II.—ON ORNAMENTAL TURNING. BY M. H. SHUTTLEWORTH, ESQ.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN—Resuming the subject of my preceding paper (see page 321, vol. I) I shall treat, in the first instance, of the slide rest. In the present case, a neces-

sary but simple instrument, being only calculated for what is termed and known among watch manufacturers in particular, under the denomination of engine-turning; but when extended to turning screws, cones, and as in the exquisite machinery of Mr. Brunel at Portsmouth, for the manufacture of blocks for the British navy, globular and elliptical bodies, it assumes a much more complicated form, and is described in many excellent mechanical works, to which I refer such of your readers as may wish to construct a superior apparatus.

It is evident, that few workmen can possess a hand sufficiently firm to guide the delicate tool, a fine steel point, which in addition to an undeviating steadiness, requires being drawn back from the work after each circle is completed. The most trivial alteration in its situation, when again projected, would totally destroy all symmetry, and cause an irreparable injury to the article. Few artizans have so true an eye, as even by the aid of the strait edge, to turn a correct cylinder, either internally or externally, or render the surface to be ornamented a perfect plane, which is highly requisite, and indeed indispensable to the beauty of the design, as otherwise the engraving will be unequal, and sometimes wholly deficient, all which difficulties are entirely remedied by the slide rest, even in its most simple form, as will be made clear in the course of these papers.

My rest consists of the following parts. See plate 1, fig. 1 and 2:—

a, the body, of the rest.—*b*, the parallel, or under slide—*c*, the leg affixed to the under slide.

d, the transverse or upper slide, to which is fixed the holdfast or receiver for the tool *e*; and *f*, is the pointed engraving tool, chisel or gauge. Its application will be rendered more intelligible by the perspective representation, fig. 2, of which a brief explanation will suffice.

The lathe is of the ordinary construction, having an excentric chuck *z*, made in the manner described in my former paper ; *y*, is the wooden chuck, carrying the lid of a snuff box *x*, or any other work to be engine-turned on its surface. This wooden chuck has the ratchet wheel *w*, affixed to it, and is mounted by its stem in the slide of the chuck *z*.

The leg *c*, of the rest must fit tight into the foot of the rest, and be secured by a screw in the usual way. The body *a*, has two grooves at right angles to each other, and in which the slides *b*, and *d*, advance or recede by the revolving screws *i*, and *h*, which may be turned by a screw-driver, or what is better, although more expensive, by small winches.

Now *b*, moving parallel to the face of the chuck, or the surface to be engraved, by means of the screw *i*, regulates the distance of the point *f*, from the centre of the chuck or surface fastened thereon, and consequently the size of the circles, and when once properly adjusted, requires no alteration. But to advance the tool *f*, to the work, the screw *h*, must be turned, and when each circle is completed, it must be withdrawn till the chuck is turned round and adjusted for the engraving a fresh one ; when it must be projected as before, and proceed in the same way till the design is perfected, which will consist of as many circles as there are teeth in the ratchet-wheel *g*, which must be turned round one tooth for each circle ; or any number of teeth may be taken, by which the whole may be divided without a fractional remainder, and with taste and skill may be productive of a great variety of embellishments.

The application of the rest to cylindrical turning, either internal or external, is easily understood ; the chisel or gouge *f*, being fixed in the holdfast, is moved along the work by the screw *h* ; for it must be understood that the

holdfast has two channels at right angles to each other, by which means the tool may be directed, as shown in the plate, of which fig. 1, represents the tool adjusted for engine or face turning, and fig. 2, for cylindrical purposes. In boring a cylinder, if the diameter be too narrow to admit the slide *d*, a tool must be made for the purpose, or I believe, may be procured at any manufactory of turning implements ; and the tool, once fixed, cannot swerve, and therefore remedies the defect before mentioned, as is apparent upon the least reflection. I may hereafter describe some further uses of this rest and chuck, but shall at present conclude, reserving directions for making the apparatus, simple and moderate in price, till a further opportunity.

Yours, &c.

M. H. SHUTTLEWORTH.

Tottenham Green, Sept. 17, 1828.

Note.—By an error in the drawing, referred to in the preceding paper, fig. 2, plate 15, the box lid has been omitted, and the face of the chuck lettered to correspond with the letter-press. The reader will therefore refer to the above fig. 1, plate I, which gives the edge view of the excentric chuck ; and on comparing the two, he will be enabled to correct the mistake.

The letters *b*, *a*, in fig. 1, plate 15, should have been engraved in a line with *C*, *D*, *h*.

The models of the chuck and slide rest are in possession of the Editors, and may be examined upon application to Mr. Partington, at the London Institution.

Recent Patents.

To SAMUEL CLEGG, of Chapel Walk, Liverpool, Civil Engineer, for his Invention of certain Improvements in the Construction of Steam Engines, Steam Boilers, and Generators.—[Sealed 20th March, 1828.]

THIS invention consists, first in a peculiarity in the construction of the working cylinder of a steam engine, and secondly in a mode of placing generators within a furnace, so that they may supply themselves with water, as occasion shall require.

The working cylinder, or rather the apparatus which is employed in its stead, is to be ring formed, or circular, not straight, as cylinders usually are; and the piston is to reciprocate in a circular direction, instead of moving to and fro, in a right line.

Plate I. Fig. 3. shews a section of the part called by the Patentee the working cylinder, *a, a*, which is not only peculiar in its semicircular form, but is made quadrangular in its sectional figure. The piston *b*, is also quadrangular, and is bent into the form of a segment of the same circle as *a*. This square form is preferred, as more convenient for the adaptation of metallic packing, (supposing the engine is to be worked at high pressure) than a round piston would be.

The rod of the piston is continued its whole length of the same form and dimensions as the piston itself, and it is to be extended through an arch of 180 degrees, more or less, as may be most convenient; but a segment, equal to

half the circumference is preferred, because that will admit of the longest stroke. The chamber is to be packed at the open end by a stuffing box *c, c*, in the way pistons are usually made steam tight at the joints.

The outer extremity of the piston rod is connected to an arm *d*, fixed to an axle *e*, in the centre of the segment; and by the reciprocating action of the piston to and fro, in its circular chamber, the arm *d*, is made to vibrate upon its axle.

It is proposed to work the piston by high pressure steam, which is admitted into the chamber *a*, by an induction valve, in the ordinary manner; and when a certain quantity of steam has passed into the chamber, the valve is to be closed and the steam allowed to expand, for the purpose of driving the piston to the end of its stroke.

There are weights *d*, attached to the outer end of the piston rod, in order to balance it, and make the pressure upon the engine uniform—that is when the steam begins to act, exerting its greatest force, the weights will be lifted, and by their gravity impede the action, but diminishing in effect, as the volume of steam expands in the chamber; and when the weights have passed the perpendicular point, their gravity on the opposite side will assist the diminishing power of the steam, and aid the action of the engine.

Two or more of these working segments with pistons may be adapted to an engine, and a lever *f*, being attached to the end of each piston rod, and to a crank on the fly wheel axle, will communicate the reciprocating actions of the pistons, to the operative parts of the engine.

It is unnecessary to exhibit a complete engine in the specification, because the improved segment chamber and its piston are all the novelties claimed as new with respect to the engine. The opening and closing of the induction and

education valves, may be effected in any of the ordinary modes, by rods connected to the working piston ; and the other details of the engine may be arranged as circumstances shall dictate.

The second feature claimed under this Patent, is a mode of supplying water to the boiler or generator of a steam engine, in such quantities as may be required for the continual production of steam. The generator is proposed to be made of tubes ; any number may be placed in a horizontal series, and they are to be so mounted within the furnace, that they may be enabled to rise and fall, as levers upon pivots, balanced by a weighted lever above.

The generators are, in the first instance, to be half filled with water, by means of an injecting, or force pump ; the weight of which quantity of water, together with that of the generator, is to be exactly balanced by the weight on the lever above ; in the same way as the weighted lever of an ordinary steelyard. On the water in the generators becoming evaporated, and driven off in the form of steam, the generators will become lighter, and consequently rise upon their pivots, which act of rising moves a small rod, which opens a valve, something in the way of an ordinary float or ball cock, from the cistern or reservoir, and allows a quantity of water to flow into the generators, until their increased weight causes the generators to descend again upon their pivots, and to close the water valve.

In this manner, by the proper adjustment of the weight on the steelyard or balance lever, a suitable quantity of water will be at all times introduced into the generators, and any variation in the quantity caused by evaporation, immediately corrected, as well as the admission of more than the necessary quantity effectually prevented.

The Patentee states that this part of the invention may be constructed and put into a working condition in various

ways, which would readily suggest themselves to every Engineer; he therefore desires it may be understood that he claims the invention of causing the generators to supply themselves with a suitable quantity of water, and to regulate that quantity by rising and falling of their pivots or an axle, as their weight decreases or increases, the whole being balanced by a weighted lever properly adjusted; and the rising and falling action of the generators, causing the valve through which the water is supplied to be opened or shut, as may be required.—[Inrolled September, 1828.]

To JOSEPH ROBINSON, of Merchant's Row, Limehouse, in the County of Middlesex, Brush-maker, for his Invention of an Improvement in the Manufacture of Brushes of certain Descriptions, and the application thereof to the Manufacture of Brushes and other purposes.—[Sealed December 4, 1827.]

THE particular features of novelty proposed under this Patent are, first, a new mode of arranging the bristle in the manufacture of that description of brushes called dusters and ground brushes, and also in the flat brushes, used by white-washers; second, in a new cement, to be employed for securing the back parts of the bristles; and third, the application of the plan as a novelty in the manufacture of brushes.

It is proposed to take about half the quantity of bristles intended to form the brush, and to draw them through a ring, which is conically formed within, as shewn by dots in Fig. 3, Plate II. When this is done, the bristles being set so as to stand nearly of the same length, the ends are to be tied up to confine them, and the remaining quantity

of bristles are to be placed round the previously secured brush. The back part of the bristles are now to be dipped into cement, for the purpose of holding them, and a ferule passed over them, as at Fig. 4, when the handle, Fig. 5, may be introduced, and its stem made fast within the ferule by means of the cement.

Flat brushes, for white-washers, may be made by connecting several of these rounded ones together, side by side, or the bristles may be held by a flat ring, as Fig. 6; two thirds of the bristle being confined within the ring, and the remainder placed outside, and connected as described.

The cement proposed to be employed, is to be compounded of two-fifths of rosin, melted over a slow fire, into which one-fifth of the quantity of plaster of Paris is to be introduced, and well mixed by stirring; then add two-fifths of shell-lac, and the whole being in a fluid state, constitutes the improved cement claimed.—[Inrolled June, 1828.]

To MELVIL WILSON, of Warnford Court, Throgmorton Street, in the City of London, Merchant, in consequence of a communication made to him by a certain Foreigner residing abroad, for an Invention of certain Improvements in Machinery for Cleaning Rice.—[Sealed December 20, 1826.]

THE machine described in the specification of this Patent, consists of a hollow cylinder, with a great number of points or teeth projecting inwards, and a shaft passing through the middle of the cylinder, also containing teeth, which shaft is intended to revolve rapidly at the time that the rice is passing through the cylinder, for the purpose of separating the grains of rice, in case of their adhering together, and breaking off any husk or other matter which may be in connection with the rice.

Plate I. Fig. 4. is a side view of the machine; *a*, is a hopper, receiving the rice from a shute, and conducting it down into the cleaning cylinder *b*. This cylinder is shewn in the section, at Fig. 5, with the shaft *c*, passing through it.

The Patentee proposes that there should be about eighty teeth in the cylinder, and that they should project, so as to reach within a very short distance of the central shaft; and that a corresponding number of teeth should be inserted in the shaft, so as to pass freely between those of the cylinder, within very small distances.

The cylinder may be placed horizontally, or vertically, or inclined, as in Fig. 4, which position is to be preferred, and may be mounted in frame work, in any way that may be found convenient. The central shaft is to be put in rapid rotary motion, and the cylinder turned slowly in an opposite direction. The rice being now allowed to descend from the hopper into the cylinder, the teeth or points, as they pass each other, will separate the grains and clean them; and the rice being discharged at the lower end of the cylinder, will fall into a shute *d*, which conducts it to the ground.

This apparatus, or machine, may be driven by hand, or by steam, or water power, and the necessary gear-work, which may be required to drive it, may be readily applied by any mill-wright.—[Inrolled June, 1827.]

To WILLIAM JOHNSON, of Droitwich, in the County of Worcester, Gentleman, for the Invention of certain Improvements in the Mode or Process and Form of Apparatus for the Manufacture of Salt, and other Purposes.—[Sealed 18th December, 1826.]

THE improvements proposed are, 1st. To crystalize or produce fine salt by the evaporation of brine or saline

liquid, through the agency of high pressure steam, in a close shallow vessel; 2dly. The moving or working of rakes or scrapers within the closed vessels or boilers, by means of machines actuated by steam power; 3dly. Obtaining and employing of steam raised from boiling brine to the heating of other vessels; 4thly. The employment of steam as a heating medium, for the production of British bay salt; and 5thly. Such an arrangement of the boilers as shall produce a large quantity of steam, to be applied to the above purposes.

The Patentee has appended to his specification, in order to illustrate the objects expressed above, an extremely rude outline sketch (see Plate II. fig. 1), from which we are enabled to collect very little information as to the real construction of the improved apparatus proposed.

The boiler *a*, is formed into three compartments, one above the other, by which means steam of a high temperature is raised by the action of the fire on the lower part of the vessel, this steam heating the vessel immediately over it, and so on; which is a contrivance described in the specifications of patents, obtained by the present Patentee some years back, and here referred to. (See the First Series of our Journal, Vols. VI. and X.)

From the lower compartment of the boiler *a*, a pipe *b*, leads to the shallow vessel *c*, which is a close box, heated by the steam thus passed into it, for the purpose of causing the brine in the upper vessel *d*, to boil. This vessel is closed by a waggon shaped top, and the steam evolved during the boiling proceeds from thence by the pipe *e*, to another vessel *f*, for the purpose of performing a similar operation.

In the bottoms of the vessels *d*, and *g*, there are recesses formed, into which the salt, as it becomes crystallized, is to be drawn by scrapers or rakers, which are to

be moving continually, by means of handles or rods passed through stuffing boxes in the sides of the vessels, the handles of the scrapers being connected to the moving part of a steam-engine.

This is all the information we are enabled to give as to the construction of the apparatus, the sketched representation being, as we have above said, so extremely rude and inefficient.—[Inrolled June, 1827.]

To THOMAS QUARRILL, of Peter's Hill, Doctor's Commons, in the City of London, Lamp Manufacturer, for his Invention of certain Improvements in the Manufacture of Lamps.—[Sealed 20th December, 1826.]

THE improvements which constitute the subjects of this patent apply principally to table-lamps, and are designed to regulate the flow of the oil to the burner with greater equality than has been effected in any of the contrivances for table-lamps heretofore adopted, and also an improved mode of raising or lowering the wick.

Plate I. fig. 6, represents a pedestal lamp for the table, the form of which may be varied according to taste or fashion. The upper part is shewn partly in section, in which *a*, is the burner and wick, made in the ordinary way, *bb*, is the vessel or reservoir containing the oil, which is conducted to the burner through the tube *c*. There is a corresponding tube *d*, on the opposite side, in which the oil rises to the same height as in the burner.

Connected with this last-mentioned tube, there is a small lateral pipe *e*, for the admission of atmospheric air into the oil vessel, which rising through the upper part of the tube *d*, discharges itself into the inverted cylin-

drical vessel *f*, and from thence passes through the oil to the upper part of the reservoir, where it acts upon the surface of the oil, and forces it through the tube *c*, to the supply of the burner.

The oil being thus conducted to the burner, flows up the tube *d*, until it closes the air passage between the lateral pipe *e*, and the upper tube, consequently the volume of air contained between the surface of the oil in the reservoir and the top of the vessel cannot now be augmented, because the aperture is closed by the oil.

Thus situated, the air in the reservoir becomes in some degree rarified, and expanded by the heat of the burner, and presses upon the surface of the oil with an increased force, but the passage for the atmospheric air being closed, as described, the oil is prevented from flowing over the edge of the burner, or of spilling, if the lamp is carried about.

The lamp and the tubes being enclosed at the lower part by a glass vase, *gg*, it is necessary in order to raise or lower the wick that some contrivance should be applied within reach to turn the gallery or rim, which is connected to the burner, and carries the glass chimney, as usual. This is effected by placing a toothed rim round the edge of the gallery, and applying a pinion at the lower part of the upright rod *h*, which may be turned, on raising the upper glass, by a rose head at top.

These contrivances will apply to some other descriptions of lamps beside that exhibited in the figure; the Patentee, therefore, claims the contrivances to whatever description of lamp they may be adapted in these words: "First, The new shaped oil vessel, contrived for the introduction of an air-chamber or reservoir, and for sealing the same; secondly, A mode of rarifying the air that regulates the float or flow of the oil, which prevents its

overflowing or spilling ; thirdly, The rack round the glass holder, by means of which the cotton is raised.—(*Inrolled June, 1827.*)

To CHARLES SEIDLER, of Crawford Street, Portman Square, in the County of Middlesex, Merchant, in consequence of a Communication made to him by a Foreigner residing Abroad, for his having discovered a Method of drawing Water out of Mines, Wells, Pits, and other Places.—
[Sealed 20th December, 1826.]

THE proposed improvement in raising water from mines, wells, and other places considerably beneath the surface of the earth, consists principally in employing condensed air as a mechanical agent acting upon the surface of the water below, for the purpose of forcing it up the rising main connected with the pump.

Plate II. fig. 2, shews a sort of diagram or sketch of the apparatus in operation, supposing it to be employed in raising water from a deep well or pit, or through a fissure in the rock, or up the shaft of a mine.

The apparatus consists of an air pump at top of the well, and a tank at bottom, connected together by pipes or tubes of leather, like engine-hose, or of any other suitable material ; *aa*, is the working cylinder of the air-pump ; *b*, the piston ; *c*, a valve-box, with a rotatory valve, which on being turned round, changes the communications of the air-pump from one pipe to the other ; *d*, is an air-pipe leading from the pump to the chamber *e*, of the tank below ; *f*, is a similar pipe, leading from the pump to the other chamber *g*, of the tank ; and *h*, is the rising main or tube, through which the water is raised from the pool at bottom to the shute or discharging trough *i*.

Let it be supposed^{*} that the piston *b*, of the air-pump is now in the act of rising, the air which follows it will be drawn into the lower part of the cylinder *a*, through the valve-box *c*, and pipe *d*, from the chamber *e*, of the tank below; consequently, from the exhaustion of air, the water will flow up, and fill the chamber *e*. The valve, *c*, must now be turned round, so as to open the communication between the upper part of the cylinder *a*, and the chamber *g*, of the tank, through the pipe *f*, when the descent of the piston *b*, will condense the air in the lower part of the cylinder, and force it through the pipe *d*, into the chamber *e*, of the tank, which will consequently expel the water from the chamber *e*, and force it up the rising main *h*, at the same time the air will be drawn from the chamber *g*, into the upper part of the cylinder, and the water will follow so as to fill the chamber *g*, in the same way as described with reference to the chamber *e*. In this way, by the action of the piston *b*, and the shifting of the valve *c*, the water will be progressively forced up the rising main *h*.

It will be perceived, that the action and reaction do not in this case balance each other, but that the larger volume of air occupying the cylinder *a*, being condensed and forced into the small chamber *e* or *g*, of the tank, will, by its elastic force, raise the water in the way described. One particular advantage attendant upon this arrangement is, that the pipes^{*} or hose leading from the pump to the tank can be twisted or contorted through any meandering passages, and to any extent, without inconvenience.

The Patentee says, that he claims "the method of applying air forced through pipes, to act directly upon water in the manner shewn, for the purpose of drawing, raising, or pumping water out of mines, wells, pits, &c.;

and also the mode of applying air so forced through pipes to act upon a piston for raising water, and for giving motion to any machinery for the purpose of drawing, raising, or pumping water out of mines, wells, &c."—
[Inrolled June, 1827.]

To CHARLES RANDOM, BARON DE BERENGER, of Target Cottage, Kentish Town, in the Parish of St. Pancras and County of Middlesex, for his having discovered and Invented certain Improvements in Gunpowder Flasks, Powder Horns, or other Utensils of different Shapes, such as are used or can be used for the purpose of carrying Gunpowder therein, in order to load therefrom Guns, Pistols, Blunderbusses, and other Fire Arms.—
[Sealed December 20, 1826.]

THESE improvements in powder flasks are contrivances, by which the charge of powder received into the tube at the top of the flask, ready for loading the piece, is slid round, and brought over a discharge pipe, by which it is passed into the gun, without inverting the flask, as in the usual mode.

Plate II. Fig. 7. represents the top of one of these improved powder flasks, shewn in perspective; *a*, is the tube which receives the charge of powder, and is standing over the aperture in the top of the flask, through which the powder is passed for the charge. When the tube is charged with powder, a small slider at the under part cuts off the communication with the interior, and retains the powder in the tube, as in the ordinary flask.

In conveying the powder from the tube to load the gun, instead of inverting the flask, as is the ordinary way, the lower end of the pipe *c*, is inserted into the muzzle

of the gun, when the thumb of the sportsman presses against the tail of the lever *b*, and brings the tube over the pipe *c*, when the powder is immediately discharged from the tube *a*, through the pipe *c*, into the gun barrel; and when this is done, a spring within carries the tube back again to its former situation.

The upper end of the tube *a*, is covered with a disc of leather, which will be blown out without mischief, in case of the powder accidentally exploding as it passes into the barrel; and there is a plug brought up, which closes the aperture into the flask as the tube slides away, in order to cut off the communication.

The Patentee claims to be the inventor of the following particulars; 1st. The sliding tube for holding the charge of gunpowder ready to be introduced into the gun, and the leather cap at the top to prevent danger, from accidental explosion. 2d. The side pipe or funnel, for conducting the charge of powder into the barrel of the gun without inverting the flask. 3d. A plug connected with the sliding-tube, which passes into the aperture in the top plate of the flask, to prevent any explosion of the charges communicating with the interior.—[Inrolled June, 1827.]

To WILLIAM MILLS, of Hazelhouse, in the Parish of Bisley, in the County of Gloucester, Gentleman, for his Invention of Improvements in Fire Arms.—[Sealed October 18, 1826.]

THIS proposed improvement in fire arms, consists of a rest to be attached to the butt part of the stock of a fowling piece, or other guns, against which the right arm may press, in the act of firing, for the purpose of steadying the piece, and taking a more certain aim.

The rest is proposed to be formed as a crutch, the stem of which is passed into a mortice hole in the butt. Plate II. Fig. 8, shews a portion of the gun-stock, with the rest inserted in it; *a*, is the rest, formed with a horned or semicircular top, supported by bracers connected to the stem. When the stem has been passed into the mortice hole, it is made fast by a screw *b*; and in firing, the hollow of the crutch receives the arm of the sportsman near the wrist, which being pressed against it, confines the piece tightly to the shoulder.

The rest may be constructed in several ways, such for instance as exhibited at Fig. 9, where the crutch is screwed into a staple, intended to be fastened to the butt; and other forms of crutch and modes of attaching them, may be devised, all of which come within the intention and claim of the Patentee.—[Inrolled April, 1827.]

To WILLIAM BUSK, of Broad Street, in the City of London, Esq. for his Invention of certain Improvements in propelling Boats and Ships, or other Vessels, or Floating Bodies.
[Sealed October 18, 1826]

THERE are two plans for propelling suggested under this Patent. The first is a paddle board, which is to be carried through the water, by means of jointed levers, with a sort of crank movement; the resistance of the paddle against the water giving the propelling stroke. The second is a series of radial paddles revolving within a cylindrical case, the rotation of which causes a powerful current of water to be sent out of the cylinder by centrifugal force, and the vessel to be impeded in an opposite direction by the reaction.

Plate II. Fig. 10, represents a portion of a vessel with the propelling apparatus first mentioned, adapted thereto; *a*, the fly wheel of a steam engine, revolving upon a shaft, in the ordinary way; *b*, is a sweep rod attached to the rim of a fly wheel, and to the lever *c*, by a joint *d*; which lever *c*, vibrates upon its fulcrum pivot *e*, fixed in the side of the vessel. Near the joint *d*, the paddle board *f*, is affixed to the end of the sweep rod, and as the fly wheel goes round, the paddle board is passed through the water, in an arc of which the fulcrum pivot is the centre; and in thus passing meets with that resistance against the water which impels the vessel forward.

There is a peculiarity in the construction of the paddle board, the particular object of which is not pointed out in the specification; it consists of a broad flat board, with two narrow pieces attached to its edges.

The paddle is proposed to be worked by the crank movement, above described; but any other mechanical contrivance, which will move it through a suitable arc, may be employed instead.

The second contrivance for propelling vessels is exhibited in Fig. 11; *a*, is a hollow cylinder, to be placed lengthways by the side of the vessel, within which there is an ordinary paddle wheel, with radial float boards. This wheel is made to revolve rapidly upon its axis, by means of an engine within the vessel, and the water being admitted into the cylinder at the contracted opening in the end *b*, will be driven out at the opposite end *c*, by the centrifugal force of the revolving wheel; which force being towards the after part of the vessel, will propel it in the opposite direction.—[Inrolled April, 1827.]

TO ANTHONY SCOTT, of Southwark Pottery, in the County of Durham, Earthenware Manufacturer, for his Invention of an Apparatus for Preventing the Boilers of Steam Engines and other similar Vessels of capacity becoming Foul, and for cleaning such Vessels, when they become Foul.—[Sealed August 4, 1827.]

THE means proposed of preventing the accumulation and adhesion of sediment and foul matter on the bottoms and sides of boilers, is by placing plates, slabs or trays of metal, stone, clay, wood, or any other suitable material, near the bottom of the boilers; upon or into which the sediment from the boiling water will fall; and when it may be requisite to clean out the boiler, it will only be necessary to remove these plates, slabs, or trays, and to scrape out the sediment or incrustation therefrom, without touching the internal surface of the boiler itself.

These plates, slabs, or trays, are not to lay in close contact with the bottom of the boiler, but are to be raised upon feet or ledges, in order that the water may pass freely over the bottom of the boiler, beneath the trays. By this arrangement, it is said that the water above the slabs or trays, will be very little disturbed by the boiling, and that the sediment will consequently descend by its gravity, without impediment.—[Inrolled September, 1827.]

TO JOSEPH HALL and THOMAS HALL, his Son, both of Leeds, in the County of York, Braziers and Brass-Founders, for their having found out or discovered an Improvement in the Making and Manufacturing of Metallic Cocks, for Drawing off Liquids.—[Sealed October 11, 1827.]

THE Patentees propose to make metallic cocks of lead, or of a mixture of lead and antimony, instead of brass or other hard metals, such as cocks are usually made of; the

advantage of which are stated to be, that the cocks will be less liable to break, or to get out of repair.

A mixture of lead and antimony, or of zinc, in the proportion of one ounce of antimony, or three ounces of zinc, to one pound of lead, is stated to be the best alloy of which these improved cocks can be made.

Nothing peculiar is proposed in the form of the cock, but that such parts of the barrel and the plug as come together, should be bushed with brass, or some such hard metal, in order to preserve the figure, and keep the joints sound and water-tight.—[*Inrolled December, 1827.*]

To BENJAMIN SOMERS, of Langford, in the Parish of Bennington, in the County of Somerset. M. D. for his Invention of certain Improvements on Furnaces for smelting different kinds of Metal Ores and Slaggs.—[*Sealed 28th April, 1827.*]

THE Patentee proposes to build his smelting furnaces of slaggs of ore, and by placing an intense fire within, to cause those slaggs partially to melt, and form an incrustated surface, which after cooling, will be so hard and close, as to resist the future action of fire.

The description of the manner of constructing the furnace, as given in the specification, does not convey in very clear terms, the Patentee's plan of operation. It seems that in iron pan is to form the bottom of the furnace, and to have holes perforated in it, which are to be tapped for drawing the fluid metal, when the furnace is in action; and slaggs of ore are to be built up round the pan, and closely beaten together. The sides are to be made inclining as usual. When this is done, a strong fire is to be raised within, and urged by blasts as usual, which will partially burn away the slag; to those fresh slaggs must be added until the whole of the internal part of the furnace has become compact and firm. [*Inrolled October, 1827.*]

Society of Books.

The Hunterian Oration: Delivered in the Theatre of the Royal College of Surgeons in London, on the Fourteenth Day of February, 1828, by SIR WILLIAM BLIZARD, KNT. F.R.S. F.A.S. F.R.S. Ed. &c. &c. Printed at the request of the College.

THIS is the third Hunterian Oration delivered by this distinguished individual. They were especially founded by Dr. Baillie and Sir Everard Home, for the advancement of surgical knowledge, and in the hands of Sir Wm. Blizard appear peculiarly adapted for their intended end.

Our author in the opening of the Oration, takes a rapid review of the history of the College, and we cannot resist appropriating to ourselves a paragraph in this division of the work. In the present day, when shameless quackery and bold empiricism is found in almost every branch of science, it becomes peculiarly our duty to protect the "healing art" from their intrusion.

"Men, totally ignorant of that art and science, the practice of which they have the audacity to profess; unreasoned by natural feeling, by moral sentiment, or by a sense of religious obligation; are sporting with the health, happiness, and lives of human beings, without legal controul." This is an eloquent and true picture of a large portion of the best paid individuals in the medical profession.

The Museum attached to the College is less known than it merits, and we are glad to see by a reference to the present Work, that more than three thousand persons were

benefited by an examination of its contents, during the last year. "Princes and Sovereigns," observes Sir William Blizard, "who have visited the Museum, must thence have been inspired with correct ideas of animal structure and economy; of the utility and genuine dignity of the healing art; of the just pretensions of its honourable professors to national respect and gratitude; and consequently with the desire of promoting objects of the highest importance to the people under their guidance and protection; by inclining them to meditate on the works of Creation, and by directing men of philosophical research to the certain paths of science."

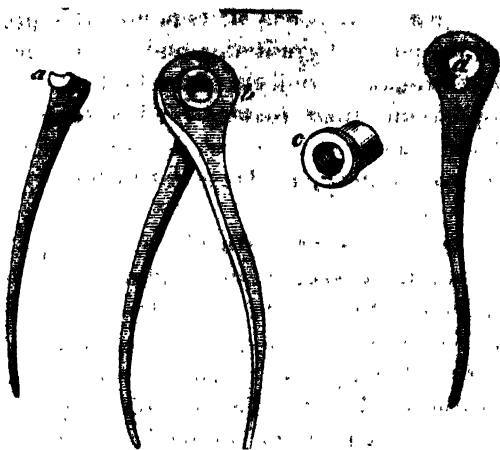
It is gratifying to hear the great living parent of surgery employing language such as this. Materialism is not an essential part of physiology. We thank God, that the smart resulting from a cut finger has always been more than repaid by the opportunity that it afforded of briefly examining the wonderful mechanism of the part affected. The mind must, indeed, be strangely constituted, that could suck poison from so sweet a flower.

Nobel Inventions.

Lighting Mines with Gas.

MR. PINCUS, of Philadelphia, has been engaged for some time, in maturing a method of Lighting Mines with Gas; and hopes by his improved plans to prevent the possibility of explosion, from the presence of what is called fire damp in foul mines. He has an improved safety-lamp, adapted to this species of light, in which he sup-

ports combustion, by means wholly independent of the atmosphere of the mine ; it affords a brilliant light, whose rays are unobstructed by wire gauze. Mr. Pinkus has promised to furnish us with drawings of the lamp, and a detail of the *modus operandi*, which we shall have pleasure in laying before our readers at an early period.



Screw Wrench for Circular Bolts.

THE apparatus represented in the above wood-cut has long been a desideratum with the practical artisan. It was invented by Mr. Jones, in whose patent wheel manufactory it is extensively and usefully employed. We have already described the Patent iron wheel with which the wrench really originated, and regret that our space will not at present permit an extended notice of the numerous curious lathes and drilling machines contrived by Mr. Jones, as the simplicity of this apparatus is not among the least of its recommendations. The lever of the wrench *d*, is furnished with a circular opening, and another and smaller aperture *c*, shewn beneath.

The clamping lever *a*, is inserted at the small semi-cir-

cular opening, and applied to the bolt head or nut *c*, and as such, the screw *f*, is put in motion. The apparatus is seen complete at *b*.

Road Making.

THE mire of the roads near the metropolis in wet weather, and their dustiness in times of drought, have often been complained of, as both inconvenient and expensive. The matter that causes these inconveniences, has been found not to be the powder worn from the gravel, or flints, or broken-stone used in making the roads; but from the rising of the sub-soil, which is in whole districts mostly, or partly of clay, and therefore very retentive of moisture. To cure the evil, two things are wanting—a better drainage of the water, and a harder foundation for the broken stones to be laid upon. The drainage is always a matter of mere engineering and expense; but the improvement of the foundation is a good deal more difficult, at least involves additional expense. A pavement of large stones would be the best foundation, if those stones could be cheaply obtained, of sufficient size and regular shape; but in some districts there is no natural stone, nor any to be had, the carriage of which would not make a serious addition to the expense. An experiment for the obviating of both difficulties has been tried, with every chance of success, upon a very bad part of the archway road, a little beyond Highgate; the ground has been cut to some depth in the centre, a complete set of under-ground drains has been put in at the side of the carriage way, and also across. Then the middle has been laid with a pavement of artificial stone formed of pebbles, Roman cement and sand, in blocks of regular size; and the broken stones have been laid over the whole. The experiment is yet hardly completed, and the upper surface of the road is not yet consolidated; but as far as we can judge, it will render the road far more economical in the wear of cattle and repairs.

New Application of the Agency of Steam.

A NEW application of the power of steam and machinery for working marble, and the other costly stone used in public and domestic architecture, has been some time in operation, and is now advanced towards perfection. We have been favoured by the patentees, Messrs. Tulloch and Co. with a view of the machinery, and the process of manufacture, which is carried on at Esher Street, Hollywell Street, Millbank, Westminster, and we are satisfied that it is calculated to add considerably to the durable elegance of all our internal architecture.

The great expense of the various descriptions of marble, as well as other ornamental stone, and thence the necessity of having recourse to moulded and other substitutes, is occasioned chiefly by the cost of carriage, and by the wages of labour to the mason. There are few species of stone which are relatively expensive at the quarry. The expense of carriage has already been much diminished, and rail roads and other improved modes of conveyance, may be expected, which will occasion a further reduction of this part of the cost. The application of steam and machinery, to perform the labour of fashioning the stone for use, must be looked for to reduce the main expense. It appears to us that Messrs. Tulloch and Co. have succeeded to a considerable extent in the attainment of this object. When we visited the manufactory, their machinery was in perfect operation. The first of their series of machines was a new steam saw for cutting the marble, and on a large block, fourteen blades at once were at work, dividing it into as many slabs. The Patentee had, in this instance, succeeded in producing the motion usually communicated to the single saw, moved by hand labour. By the hand, only one blade is worked

* at once. By the new machine as many blades may be worked at the same time, as there are slabs required from any block of marble. Here the saving of labour is immense, and the saving of time no less advantageous. This machine also appears to us to perform the labour more safely and accurately.

The next machines were one for Sanding and Grounding slabs of stone, and another for polishing them. The former, of which we could only convey an accurate conception of by means of drawings, appears to us must also supersede hand labour; and demonstrably produce a more perfectly even surface than is at present attained by the old mode. We speak from an examination of a great variety of specimens, when we state that the machine for polishing does produce a far higher, and more durable polish on almost every description of marble, than is usually communicated by hand labour.

There are two other machines, each attended with similar advantages of expedition, accuracy, superior workmanship, and cheapness for cutting up the material into smaller dimensions, and working and polishing mouldings, &c. The machinery is at present applicable only to plane surfaces, circles, and regular figures. For irregular forms and ornaments, such as Corinthian capitals, the hands of the sculptor or the mason is still required, but the most common processes are all greatly improved, and must be reduced in expense by the new machinery. We saw specimens of the complete work, in magnificent chimney pieces, fluted and plain columns, tessellated pavements, circular and sunk work for tables, slabs and mouldings of various descriptions, slabs from a quarter of an inch upwards, and linings for rooms, in all varieties of marble.

The grand effect of polished marble walls has been

presented to the fashionable world, on the staircase of Crookford's. The walls of the chief public buildings, and the most considerable private mansions, found at Pompeii and Heroulaneum, were cased with slabs of polished marble; and antiquarians are aware that the cities of the Romans derived their chief splendour from the profuse use of this material. When improved conveyance shall give us advantages, similar to those possessed by that people in the vicinity of the Italian marble quarries; when the mighty power of steam comes into full operation, and affords us, as it will, greater advantages than they possessed in their boundless command of slave labour, the frail fabrics of our modern architectural deformities must give way to edifices that will equal the finest monuments of antiquity in durability, and exceed them in elegance and splendour.

Lithochromy, or the Art of multiplying Oil Coloured Paintings, by Lithography.

THE art of Lithography, in which designs are executed with one tint, has been carried to great perfection in Germany. M. Boisseree has long ago succeeded, by the successive application of several plates, to give to lithographic drawings, executed under his direction by M. Strixner, all the effect of a design coloured with several tints. More recently, however, M. Malapeau has attempted to obtain oil pictures by means of the mechanical process used in lithography. After painting on the stone the general design, no fewer than twenty-seven rollers are then in succession passed over the stone, in order to communicate to it all the colours which enter into the picture. An impression is then taken in the usual manner, and of course this impression will be a picture

coloured with the twenty-seven tints which have been employed. This art is most perfect when the painting is on a large scale. M. Malapeau has executed a Christ larger than life, the effect of which is said to be surprising.—*Revue Encyclopedique.*

Theory of Sir H. Davy's Safety Lamp. By G. LIBRI.

AN interesting paper on the nature and properties of flame, was lately read by G. Libri, at the Society of Georgofili (Florence). The author was led to doubt the correctness of the theory or explanation given by Sir H. Davy, in order to account for the phenomenon of his safety lamp. The distinguished inventor ascribes the security which the lamp affords to the conducting power of the metallic gauze, by which it is supposed the temperature of the flame is so much lowered as to be insufficient to ignite the inflammable mixture on the outside. Some facts known to the author were at variance with this hypothesis; and he found upon trial, that when single rods were made to approach a flame, the latter was always inflected on all sides from the rod, as if repelled by it, and that this effect was independent of the conducting power of the rod, whether good or bad. The amount of inflection or repulsion was directly as the mass, and inversely as the distance from the flame. It was not diminished by increasing the temperature of the rod, even to such a degree as to render it scarcely possible for it to abstract any of the caloric. In fact, when two flames are made to approach each other, there is a mutual repulsion, although their proximity increases the temperature of each instead of diminishing it.

“From these principles,” says the author, “the theory of the safety lamp is easily deduced. A metallic wire, exerting, according to its diameter and its own nature, a

constant repulsion upon flame, it is evident that two parallel wires, so near each other as not to exceed the distance of twice the radius of the sphere of repulsion, will not permit a flame to insinuate itself between them, unless it be impelled by a force superior to the intensity of repulsion. If to these two wires others be added, a tissue is formed impenetrable to flame, especially when the conducting power of the wires adds its influence to that of the repulsion."

The author conceives, that, from the views above stated, the number of cross or horizontal wires in the Davy lamp is unnecessarily great, and that by rejecting all of these excepting a number sufficient to secure the firmness of the tissue, the lamp would afford as great a security as at present, and at the same time diffuse a much greater light. This opinion he has verified by actual experiment.—*Bibliothèque Universelle de Geneve.*

On the use of Steatite or Soapstone for diminishing Friction in Machinery. By Mr. E. BAILEY, Boston.

THIS mineral has been long in use at the extensive manufactories at Lowell, in North America. For this purpose it is thoroughly pulverised, and then mixed with oil, tallow, or tar, whichever may be the best adapted to the use for which it is designed. It is of course important to procure that which is free from *grit*; and it can be purified in a good degree by mixing the powder with oil, and diluting it after it has stood a few minutes. The heavier particles will form a sediment to be rejected. It is used on all kinds of machinery where it is necessary to apply any unctuous substance to diminish friction; and it is said to be an excellent substitute for the usual compositions applied to carriage-wheels.

Some idea of the value of soapstone, in this use of it, may be formed from the following fact, communicated by D. Moody, Esq. the superintendant of the tar-works on the Mill-dam, near Boston:—Connected with the rolling-machine of that establishment, there is a horizontal balance wheel weighing *fourteen tons*, which runs on a step of five inches diameter, and makes from seventy-five to a hundred and twenty-five revolutions in a minute. About a hundred tons of iron are rolled in this machine in a month; yet the wheel has sometimes been used from three to five weeks without inconvenience, before the soapstone has been renewed. The superintendant thinks, however, that it ought to be more frequently applied.

This use of soapstone was discovered at Lowell by an accident, the circumstances of which it is not necessary now to repeat. It is sufficient to say, that it is regarded by those who have used it, as an invaluable discovery. I have been assured that it has never been known to fail of producing the desired result, when applied to machinery which has begun to be heated, even in those cases where nothing else could be found which would answer the purpose.—*Silliman's Journal of Science*.

Improvement of Candles. By JOHN MURRAY, F. L. S.
and Lecturer on Chemistry. *From Brewster's Journal.*

I STEEP the cotton wick in lime water, in which I have dissolved a considerable quantity of *nitrate of potassa*, (*chlorate of potassa* answers still better, but is too expensive for common practice,) by this means I secure a purer flame, and superior light;—a more perfect combustion is insured,—snuffing is rendered nearly as superfluous as in

wax candles, and the candles thus treated do not "run." The wicks must be thoroughly dry before the tallow is put to them.

A Pyrometer for measuring high Temperatures.

By JAMES PRINSEP, Esq. Benares.

AFTER trying various plans for pyrometers, Mr. Prinsep gave the preference to one founded on the following principles :—

1. That the fusing points of the pure metals are fixed and determinate.

2. That those of silver, gold, and platinum, comprehend a very extensive range of temperature ; and

3. That between these three fixed points in the scale as many intermediate ones as may be required will be obtained, by alloying the three metals together in different proportions. When such a series of alloys has been once prepared, the heat of any furnace may be expressed by the alloy of least fusibility which it is capable of melting. The determinations afforded by a pyrometer of this kind will, independently of their precision, have the advantage of being identifiable at all times and in all countries. The smallness of the apparatus is an additional recommendation, nothing more being necessary than a little cupel, containing in separate cells the requisite number of pyrometric alloys, each of the size of a pin's head. The specimens melted in one experiment, need only to be flattened under the hammer, in order to be again ready for use. For the purpose of concisely registering the results, the author employs a simple decimal method of notation, which at once expresses the nature of the alloy, and its correspondence with the scale of temperature. As the distance between the points of fusion of silver and gold is not con-

siderable, the author divides the distance on the scale into ten degrees ; obtaining measures of each by a successive addition of ten per cent. of gold to the silver, the fusion of which, when pure, marks the point of zero, while that of gold is reckoned at ten degrees. From the point of fusion of pure platina to that of pure gold, the author assumes 100 degrees, adding to the alloy which is to measure each in succession one per cent. of platina. The author then enters into a detailed account of the method he employed for insuring accuracy in the formation of the requisite series of alloys, and of various experiments undertaken to ascertain their fitness as measures of high temperatures. The remainder of the paper contains the recital of the author's attempts to determine, by means of an apparatus connected with an air thermometer, the relation which the fusing point of pure silver bears to the ordinary thermometric scale. A full account of these proceedings, which was read before the Royal Society of London, will probably appear in the next volume of their *Transactions*.

Method of making Ultramarine, discovered by M. TUNEL.

THIS most important discovery, which will give the greatest satisfaction to painters, and all the lovers of the fine arts, was announced to the Academy of Sciences in February last. The fortunate discovery of this process, which will very properly be kept secret for some time, was made by M. Tunel, inspector of gunpowder and saltpetre. It was by following the analysis of M. Clement Desormes that he succeeded in the direct formation of it, and what he obtains is actually finer and more brilliant than the natural colour. M. Tunel has already been able to supply the public with ultramarine at one guinea per ounce,

the colour having been sold from two guineas to two pounds ten shillings per ounce. He expects, however, to be able to sell it at a more moderate price.—*Le Globe.*

A Beautiful Blue Colour. By M. BRACONNOT.

A PORTION of a very fine blue pigment was placed in the hands of Mr. Braconnot, by Mr. Noel, for examination. It was the produce of a manufacture at Schweinfurt, where the preparation was kept secret. M. Braconnot readily ascertained it to be a triple compound of arsenious acid, hydrated deutoxide of copper, and acetic acid; so that it approximates to the green of Scheele. After various trials to form it, the following process was found to be the best. Six parts of sulphate of copper were dissolved in a small quantity of water; also, six parts of white arsenic, with eight parts of potash of commerce, were boiled in water, until no further quantity of carbonic acid was disengaged. This hot solution was gradually mixed with the first, continually agitating until effervescence ceased; an abundant dull yellowish green precipitate was formed. About three parts of acetic acid were then added, or such a quantity, that a slight excess was sensible to the smell; gradually the precipitate diminished in volume, and in some hours, a slightly crystalline powder was deposited at the bottom of an entirely colourless solution. The fluid was poured off as soon as possible; and the powder, washed with plenty of boiling water to remove the last portions of arsenic, was then of a brilliant colour.

Care must be taken not to add to the cupreous solution an excess of arseniate of potash, as it causes waste of the acetic acid afterwards added, as the latter must be in excess. In repeating the process in the large way, an asse-

niat of potash, prepared with eight parts of oxide of arsenic, instead of six, was used, and the result was very successful. M. Braconnot thinks that probably a slight variation of the proportions he has given may be found advantageous; but in the mean time considers it right to give the best process he is able for the preparation of a colour so beautiful, and which may be very valuable in the arts.—*Ann de Chim.*

On recovering Gold or Silver from old Gilt or Silvered Wood, &c.

UNTIL very lately, the small quantities of gold, or silver, that could be procured from the surfaces of wood, &c. which had been gilt or silvered, was not thought worth the trouble of taking off; and this wood was burnt the same as any other fire-wood, without even searching in the ashes for the gold, or silver, they contained. Persons, who were aware of its value, bought this sort of wood at a very cheap rate, and burnt it by itself, on their hearths; and afterwards, with great trouble, collected from among the ashes, all the gold, &c. they contained, by the process of amalgamation. This was difficult and troublesome, on account of the vast quantity of ashes produced by the wood; and in consequence of the thick coating of carbonate of lime, with which it had been covered, this process was by no means economical.

The following simple means may be employed with profit:—First, steep the wood in boiling water, and for this purpose a trough must be made, capable of receiving the longest pieces, and sufficiently wide to contain a number of them; then pour on the wood a quantity of boiling water sufficient to cover it, and cover the trough with a lid, which closes it as perfectly as possible, in

order to retain the steam of the boiling water, as well as to keep it hot for a long time. The operation is, however, performed better, and in less time, by means of the steam of boiling water, which may be introduced into the close vessel containing the gilded wood, and to which a safety-valve is applied; or, perhaps still better, by putting it into a boiler of the form of the trough we have described, and setting it upon the fire. The boiling water, or steam, dissolves the glue or size which secured the leaf gold; which on being detached falls into the water. In order to accelerate the separation of the leaves of gold, they take out the pieces of gilt wood, after they have been steeping for some time in the boiling water; they then put them into another vessel, containing a little hot water, and, with a brush wetted in this water, they brush over the gold, which easily separates and remains in the water, into which they are also careful frequently to dip the brush. The coat of size and whiting remains almost entire on the wood; and a part of the gold size only is removed with the gold, and is found mixed with it in the water.

They allow the water to remain at rest; and when the whole is precipitated, they decant the water, and evaporate the deposit to dryness. They then remove the matter found at the bottom of the vessel, powder it in a mortar, and expose it to the action of fire under a muffle, in order to burn all the glue and the greasy or oily substances which formed a part of the coating. The gold is then separated from it by amalgamation.

This process is also applicable to old gilt plaster, and whether it be taken off the wall, or remain upon it. In the latter case, the gilded part must be washed with hot water and a sponge, and be thoroughly cleaned off with a hard brush, frequently dipped in the hot water. But we

must by no means neglect to collect together the mortar, &c. which falls off from the walls so treated, as it generally contains a great quantity of gold, which it is important to unite in the *washings*. By this means, we have known to be recovered more than 800 franks' worth of gold, from an old chapel which was repaired.

The same process, which is made use of to recover the gold from gilded wood or plaster, is also equally applicable to the removing of any silvering which had been laid on with silver leaves. This, although less lucrative than that of recovering gold, must nevertheless not be neglected, as it produces very good results, when it is performed with dexterity and economy.

The gold and silver, also, from gold and silver lace, spun upon silk; when it becomes old, may be burnt for the purpose of collecting the gold and silver. For this purpose it is made up into packets like balls, wrapped round with iron wire, and made red-hot in a furnace; by this means the silk is reduced to ashes. When the packet is cold, they beat it in a mortar or kind of tray: the ashes all become powder, which they place upon a pasteboard, and fan or blow it gently, when the metallic parts, being the heaviest, remain, and the ashes are carried away by the wind. We must not, however, conceal the fact, that by this means, a little gold or silver will be lost, unless the ashes blown off be washed over afterwards.

There is, however, an easy means of preserving the whole of the valuable parts, if the operation is carefully performed. The lace or stuff must be cut into very small pieces, and be boiled for some time in soap-boilers' caustic lees (pot-ash, or caustic soda): these substances dissolve the silk, and the gold or silver remain pure in the liquor. The alkali must be washed off, and the deposit be afterwards parted, in order to separate the gold and silver.

[*Dictionnaire Technologique.*]

Polytechnic and Scientific Intelligence.

La Perouse.

IN the last number of the *Revue Encyclopedique* there is a paper on the expeditions which, at various times, have been sent in search of the unfortunate Perouse, at the close of which it is asserted that, although probable, it is by no means certain, that the vessels known to have been wrecked on a reef off the Manicolo Island, were the Boussole and her comrade. Could the writer of that paper have seen the *Literary Gazette* of the 12th of April last, in which is a letter from Mr. John Russel, an officer on board the Research (a vessel despatched by the Indian government for the purpose of making every possible inquiry on the subject), to his uncle, Sir W. Betham, describing the various articles which had been found on the island, and especially a part of a plated candlestick, on which was engraved a shield with arms, of which arms was inserted an accurate engraving, and shewed that they were the arms of the family of Colignon, the name of the botanist on board the Boussole? This fact as was observed at the time, afforded conclusive evidence that the vessels whose wrecks have thus been traced could be no other than M. de la Perouse's ships. How is it that so incontrovertible a proof escaped the attention of the writer in the *Revue Encyclopedique*, whose main object, indeed, seems to have been the introduction of an ode on the subject?

Academie Royale des Sciences.

AN analysis has been published by the two secretaries of the Academie Royale des Sciences, at Paris, of the

labours of the Academy during the year 1827. They appear to have been numerous and valuable. Besides a variety of communications from scientific correspondents, both in France and elsewhere, many important contributions have been made by members of the academy. Among others, posthumous papers by M. Laplace, exhibiting new means of working the long calculations of the distances of the planets; experiments by M. Biot on the pendulum, shewing that it is susceptible of great variations, and therefore that it is not a good standard of measure; inquiries by M. Fourier into the temperature of the spaces in which the planets move; meteorological observations by M. Bouvard; experiments on the refraction of a rare mineral in the Tyrol, by M. Biot; four memoirs on the laws of sound, by M. Savart; a paper by M. Girard, on roads, railways, and canals, in which the preference is given to the last; calculations respecting the known comets of our system, by M. Damoiseau; hydrographic works by Rear Admiral de Rossel, M. Beautemps-Beaupré, and others; numerous and interesting communications from the Barón Dupin; &c. &c.

Effect of Mountains on the Atmosphere.

MOUNTAINS precipitate the moisture contained in the air, not so much by attracting it to their summits, as in consequence of their rocky and grassy sides, when acted on by the sun, heating large masses of air in the cold upper regions of the atmosphere, which, streaming upwards, come in contact with cold currents, moving laterally, or otherwise generate circumstances that will cause precipitation. A small increase of elevation compensates in adding to the quantity of rain for a great distance from the sea. At

Geneva, the annual fall of rain is 40 inches; while at Paris, (300 miles nearer the sea) it is only 19½ inches. In England, it is found that Keswick and Kendal, situated among the mountains, have 67 or 69 inches of rain annually, while places in the level country, and on the sea coast, have only 24 inches. But, although more rain falls in mountainous than in level countries, the depth is greater at the bottom than at the top of a mountain, and close to the surface of the ground than at a distance from it.

Vibration of Glass Vessels indicative of approaching Storms.

PROFESSOR SCOTT, of Sandhurst College, observed in Shetland, that drinking glasses placed in an inverted position upon a shelf in a cupboard, on the ground floor of Belmont house, occasionally emitted sounds as if they were tapped with a knife, or raised up a little and then let fall on the shelf. These sounds preceded wind, and when they occurred, boats and vessels were immediately secured. The strength of the sound is said to be proportional to the tempest that follows.

Meteoric Stone which fell in India on the 27th Feb. 1827.

THIS aerolite fell in the district of Azim Gerh, nearly five miles from a village called Mhow. It fell about three o'clock, in a perfectly clear and serene sky, and was accompanied with noises like the roaring of cannons. Four or five fragments were picked up four or five miles asunder; one broke a tree, and another wounded a man severely in the arm. The largest piece weighed three pounds. It is perfectly similar to that which fell near Allahabad in 1802, and near Mooradabad in 1808. The specific gravity was 3.5. The presence of chrome and nickel were ascertained.

American Patents,**FOR INVENTIONS AND IMPROVEMENTS.**

* (Continued from Vol I. page 372.)

Improvement in plane stocks, of cast-iron ; Hazard Knowles, of Colchester, New London County, Conn., August 24.

In the composition of liquor, to start the yolk, animal oil, or grease, which wool contains, when taken from the sheep ; John Goulding, of Dedham, Massachusetts, August 24.

In the mode of manufacturing wool, or other fibrous material, in which sliver, slubbing, or roping, is unwound, or delivered, on a mule spinning machine, or drawing frame ; John Goulding, of Dedham, Massachusetts, August 24.

In the mode of scouring and washing all kinds of cloths ; John Goulding, of Dedham, Massachusetts, August 24.

In the mode of throwing the shuttle, or shuttles, in weaving ; John Goulding, of Dedham, Massachusetts, August 24.

In the washing machine, called the accelerated washer ; Moses Cass, of Caroline, Tompkins County, New York, August 29.

In making aqueducts for conveying water or gas under ground, by means of a conductor, formed of water-proof lime, as a cement for stone, wood, or brick ; John M. Benham, of Bridgewater, Oneida County, New York, August 29.

In the loom, for weaving all kinds of figured goods ; Horace Baker, North Salem, West Chester County, New York, Aug. 30.

In the art of distilling, by Aikin's improved rectifiers ; John M. Aikin, Philadelphia, August 30.

In the use, combination, and construction of boats ; Thomas Thorpe, City of Washington, District of Columbia, August 31.

In the saw, called the two-edged saw ; Moses Cass and Aaron Bull, of Caroline, Tompkins County, New York, August 31.

In the machine for paying or filling the seams of ships and other vessels, called a pitch syringe ; Daniel Flint, of Nobleboro, Lincoln County, Maine, August 31.

In the magazine percussion gun-lock ; James B. Lowry, of Mayville, Chatauga County, New York, Sept. 8.

In the machine for separating the hair, and other extraneous matter, from fur of various descriptions, to prepare it for hatters' use ; John Macdonald, of the city of New York, Sept. 11.

In the open single screw, or spiral water-wheel, called the open screw water-wheel, Elijah Skinner, of Sandwich, Stratford County, New Hampshire, Sept. 11.

In the cast-iron mill, for grinding bark ; William Torrey, of Westbrook, Cumberland County, State of Maine, Sept. 13.

In the churn ; Daniel Sheldon, of Pultney, Steuben County, New York, Sept. 13.

In the machine called the propelling water paddle wheel ; John James Giraud, of Baltimore, Md., Sept. 18.

In the mode of tanning leather ; Osmond Cogswell, of Cincinnati, Ohio, Sept. 18.

In the hoe, called the prong hoe ; Joseph Wilson, of Marlborough, New Hampshire, Sept. 20.

In Paul Hawe's machine, for making shingles ; George A. Hoard, of Antwerp, Jefferson's County, New York, Sept. 20.

In the fanning mill ; Enoch Walker, of Springville, Four Corners, Susquehanna County, Pennsylvania, Sept. 20.

In the machine for cutting shingles ; George W. Dana, of Lowville, Lewis County, New York, Sept. 20.

In a vegetable composition, or matter, for preventing or curing the scurvy, and making catchup or catsup, and various sauces ; James U. Armour, of Fredericktown, Frederick County, Md., Sept. 28.

In Israel Johnson's, jun., patent saw mill ; Anson B. Graham, of Lee, Berkshire County, Massachusetts, Sept. 28.

In the washing machine ; Franklin Kellsey, of Middletown, Conn., Sept. 28.

In the apparatus for setting saw seeth, called a spring saw set ; John Boggs, of Philadelphia, October 4.

In the printing press ; Samuel Couillard, of Boston, Oct. 5.

In the machine called a power gained lever ; Edward G. Fitch, of Blakely, Baldwin County, Alabama, October 5.

In the thrashing machine ; Ebenezer B. Pike, of Litchfield, Maine, October 5.

In the mode of making pressed glass knobs, for furniture, &c. at one operation ; John Robinson, of Pittsburg, Pennsylvania, October 6.

In the construction of a flexible rack, and manner of application for operating on ships' carriages, or other carriages, used in the marine or other rail-ways ; Jesse Wood and Paul A. Sabbator, of New York, October 6.

In hydraulics ; Jacob Roup, of Kenhava County, Virginia, October 6.

In the cast-iron sled shoe, and cutter shoe ; Edward Trask, Sangerfield, Oneida County, New York, October 6.

In Dearborn's patent warehouse balance, so called, for weighing all kinds of substances, whether gross and ponderous, or light and delicate, called Blaisdel's improved avoirdupois balance ; Samuel Blaisdel, of Lancaster, Fairfield County, Ohio, October 10.

In the machine for mortising and tenoning timber ; John McClinton, of Chambersburg, Pennsylvania, October 8.

In the machine for making plastering laths ; Thomas Wright and Abraham P. Howell, of Cincinnati, Ohio, October 9.

In the machine called the screw cradle, for raising ships or vessels, of any size or weight, entirely out of water, in order to repair, or for any use required ; Charles Miner, of Lyme, Conn., October 12.

In the lever percussion gun lock ; John Ambler, junr. of South New Berlin, Chenango County, New York, October 16.

In the construction and use of moulds with a core, for pressing glass into various useful forms, called Dummer's scallop, or coverplate ; Phineas C. Dummer, of Jersey city, New Jersey, October 16.

In forming glass by the combination of moulds with mechanical powers ; George Dummer, Phineas C. Dummer, and James Maxwell, of Jersey city, New Jersey, October 16.

In the vertical bucket or float wheel, for propelling boats ; Stacy Costill, of Philadelphia, October 17.

In a bobbin tube for spinning cotton ; Benjamin Hutchinson, of Philadelphia, October 18.

In propelling machinery by weights ; Cain Broyles, of Tellico, Munro County, Tennessee, October 19.

In the trip-hammer, propelled by the foot ; Ebenezer Pierce, and Joseph Hathaway, of Pultney, Steuben County, New York, October 19.

In the mode of casting types, called the mechanical type caster ; Stephen Sturdevant, and Edwin Starr, of Boston, October 23.

In the water-proof stiffening for hats, called " Hempstead's improved stiffening to water-proof and stiffen hats," his former patent for the same invention, dated the 25th day of May, 1827, being cancelled on account of a defective specification, May 25th, 1827, re-issued ; Stephen Hempstead, junr. of St. Charles County, Missouri, October 26.

In the machine for cutting works ; George Rawlins, of Philadelphia, Oct. 30.

In the application of the scape heat from the furnace, and the discharged steam from the engine of the ordinary high pressure steam engine, to the manufacturing of course salt, from salt water ; Alexander Brown, of Salina, New York, Oct. 30.

In making steel cylinders or mills, as they are commonly called, for the purpose of impressing figures or devices on copper rollers for calico printing, *by biting in the figures or devices on the steel cylinders, by means of acid,* the process which is usually called etching ; David H. Mason, and Matthias W. Baldwin, of Philadelphia, October 30.

In distilling ; William J. Cocke, of Surrey County, Virginia, October 30.

In the planing machine ; Josias Reihm, of Savage Factory, Maryland, November 1.

In the construction of clocks ; Harrison G. Dyar, of New York, November 6.

In cast-iron, or other metal hubs, for wheels of carriages ; Benjamin Lyman, of Manchester, Conn. November 6.

In the method of cleaning and polishing rice, coffee, and other grain ; Elijah Wilder, of Jersey city, New Jersey, November 6.

In the mode of making or manufacturing machines, for cutting fur from skins, for hatters' use, called the cant twist blades for cutter ; Charles C. K. Beach, of Portland, Cumberland County, Maine, November 10.

In the percussion gun-lock, with a magazine ; Joseph Shattuck, of Jefferson County, Ohio, November 10.

In making moccasins water proof ; John Syms, of New York, November 10.

In the mode of letting water on water wheels ; Michael Hildebrand, of M'Minn County, Tennessee, November 10.

In the retention or discharge of fluids, more particularly water ; Bradford Seymour, of Westmorland, Oneida County, New York, November 10.

In the musical instrument called the Kent Bugle, which he denominates the harmonic pocket bugle ; Richard Willis, of West Point, Orange County, New York, November 10.

In the machine for making shingles ; Oliver Wheeler, Monroe County, New York, November 10.

In the mode of imitating all kinds of marble, for the fronts of houses, and perfecting and embellishing hard finished walls ; Benjamin Trembley, of New York, November 13.

List of Patents

GRANTED IN SCOTLAND SINCE JUNE 20, 1828.

For certain improvements on anchors. To William Rodger, county of Middlesex.

For an improvement in boiling or evaporating solutions of sugar and other liquids. To John Davis, County of Middlesex.

For certain combinations of machinery for generating and

communicating power and motion applicable to the propelling fixed machinery, as also floating bodies, carriages, and other locomotive machines and instruments. To Thomas Stanhope Holland, city of London.

For certain improvements in the method or apparatus for generating Carburetted Hydrogen Gas, and in purifying the same. To Henry Pinkus, Parish of St. James's, Westminster.

For an improvement or improvements in machines adapted for spinning, doubling, twisting, roving, or preparing cotton and other fibrous substances. To Maurice de Jongh, county of Lancaster.

New Patents Sealed in 1828.

To George Stratton, of Frederick Place, Hampstead Road, in the County of Middlesex, Gentleman, for his inventing an Improvement in warming and ventilating churches, hothouses, and all other buildings, which improvements may be applied to other purposes.—28th August, 6 months.

To Granville Sharp Pattison, of Old Burlington Street, in the City of Westminster, and County of Middlesex, Esq. in consequence of a Communication from a Foreigner residing abroad, of a new and improved method of applying iron in the sheathing of ships and other vessels, and of applying iron bolts, spikes, nails, pintals, braces and other fastenings, used in the construction of ships and other vessels.—4th September, 6 months.

To John Seaward and Samuel Seaward, of the Canal Iron Works, in the Parish of All Saints, Poplar, in the County of Middlesex, Engineers, for their having invented a new and improved method or methods for propelling or moving carriages and all other vehicles on roads, and also ships, boats and other vessels on water.—4th September, 6 months.

To Charles Sanderson, of Park Gate Iron Works, near Rotherham, in the County of York, Iron Master, for his having invented a new method of making shear steel.—4th September, 2 months.

To Samuel Brooking, Esq. of Plymouth, in the County of Devon, a Rear Admiral in the Royal Navy, for his Invention of a new method or mode of making sails of ships and other vessels.—4th September, 6 months.

To John Robertson, of Limehouse Hol^o, in the Parish of All Saints, Poplar, in the County of Middlesex, Rope Manufacturer, for his Invention of certain improvements in the manufacture of hempen rope or cordage.—4th September, 6 months.

To William Bell, of Lucas Street, Commercial Road, in the County of Middlesex, Gentleman, for his having invented improved methods for filtrating water and various other liquors.—4th September, 6 months.

To William Farish, of Cambridge, Jacksonian Professor in the University, for his having invented an improved method or methods of clearing out watercourses.—4th September, 6 months.

To Thomas Robinson Williams, of Norfolk Street, Strand, in the County of Middlesex, for his having invented or found out certain improvements in the making of hats, bonnets and caps, and in the covering of them with silk and other materials, with the assistance of machinery.—11th September, 6 months.

To Thomas Milikew, of Berwick Street, St. James's, in the County of Middlesex, Cabinet Maker, for his having invented or found out an improvement in the construction, making or manufacturing of chairs, sofas, lounges, beds, and all other articles of furniture, for similar purposes, and also of travelling and other carriages and vehicles of every description, for personal use.—11th Sept. 2 months.

To James Beaumont Neilson, of Glasgow, in the

County of Lanark, in North Britain, Engineer, for his having invented and found out an invention for the improved application of air to produce heat in fire forges and furnaces, where bellows or other blowing apparatus are required.—11th September, six months.

To Lemuel Wellman Wright, of Mansfield Street, Borough Road, in the County of Surry, Engineer, for his having invented certain improvements in machinery for making screws.—18th September, 6 months.

To William Losh, of Benton House, in the County of Northampton, Esq. for his invention of certain improvements in the formations of iron rails for rail roads, and of the chains or pedestals, in or upon which the rails may be placed or fixed.—18th September, 2 months.

To Joseph Rhodes, the younger, of Alverthorpe, in the Parish of Wakefield, Worsted Spinner, for his having invented certain improvements in machinery for spinning and twisting worsted yarn, and other fibrous substances. 18th September, 6 months.

To Joseph Clisild Daniell, of Limpley, in the Parish of Bradford, in the County of Wilts, Clothier, for his having invented improvements in the machinery used for dressing woollen cloth.—18th September, 6 months.

To John Melville, of Upper Harley Street, Cavendish Square, in the County of Middlesex, Esq. for his having invented certain improvements in propelling vessels.—18th September, 6 months.

To Edward Forbes Ocson, of Finsbury Square, in the County of Middlesex, Gentleman, for his having invented an improved cartridge for sporting purposes.—18th Sept. 6 months.

To John Jones, of Leeds, in the County of York, Brush Maker, for certain improvements in machinery, or apparatus for pressing and finishing wollen cloth.—25th Sept. 6 months.

Meteorological Journal.

DATE.	HOUR.	BAROM.	Thermometer.	
			IN.	OUT.
AUG.				
29	9	30.20	67	68.2
	3	30.20	70	74.2
30	9	30.25	66	68.0
	3	30.10	69	75.4
31	9	30.15	64	64.5
	3	30.00	63	67.0
SEP. 1	9	30.10	63	63.7
	3	30.15	64	70.0
2	9	30.20	59	62.5
	3	30.00	62	66.0
3	9	30.15	60	59.5
	3	30.10	64	65.5
4	9	30.10	60	63.0
	3	30.16	64	66.3
5	9	30.15	61	62.5
	3	30.12	61	63.4
6	9	29.90	68	67.5
	3	29.85	69	74.2
7	9	29.75	68	67.3
	3	29.75	70	73.0
8	9	29.70	66	67.0
	3	29.70	66	67.1
9	9	29.60	65	66.2
10	9	29.60	64	65.2
	3	29.65	66	69.0
11	9	29.72	66	68.3
	3	29.80	65	69.2
12	9	29.75	63	64.2
	3	30.10	62	64.8
13	9	30.20	61	53.2
	3	30.25	60	58.0
14	9	30.30	56	51.6
	3	30.32	51	58.0
15	9	30.42	54	55.0
	3	30.45	56	59.2
16	9	30.45	59	59.8

CELESTIAL PHENOMENA, FOR OCTOBER 1828.

D.	H.	M.	S.		D.	H.	M.	S.	
1	0	0	0	Clock before the ☉ 10° 25"	18	11	0	0	☽ in conj. with ♄ in Aquarius
3	3	0	0	☾ in conj. with 1♄ in Cancer	20	0	0	0	Clock before the ☉ 15° 8"
3	5	0	0	☾ in conj. with 2♄ in Cancer	21	12	0	0	☽ in conj. with ♄ in Pisces.
4	5	0	0	☾ in conj. with ♄ in Leo.	21	17	0	0	☽ in conj. with ♄ in Pisces.
4	12	0	0	☾ in conj. with ♄ in Leo.	22	6	0	0	☽ in conj. with ♄ in Pisces.
5	0	0	0	Clock before the ☉ 11° 38"	22	13	12	0	Ecliptic opposition, or ☉ Full Moon.
5	0	0	0	☽ Stationary.	22	22	32	0	☽ Enters Scorpio.
6	15	0	0	☾ in conj. with ♄ in Leo.	25	2	0	0	☽ in conj. with ♄ in Leo.
7	1	0	0	☽ in conj. with ♄ in Leo.	25	3	0	0	☽ in conj. with 1♄ in Taurus.
8	0	0	0	☽ eclipsed invisible.	25	3	0	0	☽ in conj. with 2♄ in Taurus
8	12	18	0	Ecliptic conj. or ☽ new moon	25	0	0	0	Clock before the ☉ 15° 50"
9	23	0	0	☽ in conj. with ♄ in Virgo.	26	17	0	0	☽ in conj. with ♄ in Leo.
10	0	0	0	Clock before the ☉ 13°	30	0	0	0	Clock before the ☉ 16° 13"
11	9	0	0	☽ in conj. with 4♄ in Libra	30	4	34	0	☽ in ☉ or last quarter
11	18	0	0	☽ in conj. with ♄ in Libra.	30	11	0	0	☽ in conj. with 1♄ in Cancer
12	10	0	0	☽ in conj. with ♄ in Oph.	30	12	0	0	☽ in conj. with 2♄ in Cancer
13	5	0	0	☽ in conj. with ♄ in Leo.	31	11	0	0	☽ in conj. with ♄ in Leo.
15	0	0	0	Clock before the ☉ 14° 11"	31	20	0	0	☽ in conj. with ♄ in Leo.
15	18	47	0	☽ in ☐ first quarter.					
16	10	0	0	☽ in conj. with ♄ in Capri.					

☽ The Waxing Moon. — ☾ The Waning Moon.

Rotherhithe.

J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR AUGUST AND SEPTEMBER 1828.

1828.	Thermo.		Barometer.		Rain in in- ches.	1828.	Thermo.		Barometer.		Rain in in- ches.
	Hig.	Low.	Hig.	Low.			Hig.	Low.	Hig.	Low.	
AUG.						SEPT.					
26	73	52	30,26	Stat.		11	68	50	29,56	29,55	,225
27	71	49	30,25	30,20		12	64	57	29,46	29,35	,25
28	73	50	30,16	30,13		13	68	56	29,56	29,46	
29	71	51	30,12	Stat.		14	54	48	30,02	29,56	,325
30	70	56	30,12	30,09		15	62	44	30,31	30,16	,05
31	63	53	30,06	30,00		16	59	36	29,48	29,46	
SEPT.						17	62	37	30,31	30,20	
1	72	55	29,96	29,90		18	65	45	30,01	29,99	
2	70	52	29,93	29,92		19	68	43	30,02	29,96	
3	65	45	30,00	Stat.		20	68	42	30,12	30,10	
4	68	51	30,02	Stat.		21	67	37	30,12	30,04	
5	66	49	29,96	Stat.		22	64	42	29,92	29,91	
6	66	43	30,00	29,96		23	67	48	30,05	30,00	
7	73	55	30,00	Stat.	,05	24	68	51	30,04	30,00	
8	74	53	29,95	29,81		25	71	51	29,92	29,84	
9	70	56	29,86	29,73	,05						
10	66	45	29,29	56,29	,025						

LOWER EDMONTON.

CHARLES H. ADAMS

Lat. 51° 37' 32" N.

Long. 3° 51' W. of Greenwich.

JOURNAL OF ARTS AND SCIENCES.

No. IX.

[SECOND SERIES.]

Original Communications.

ART. VII.—ON THE LAWS RELATIVE TO PATENTS.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—The general sentiments expressed by your correspondent, Mr. De Jongh, in his able exposition of the evils and absurdities of the entire system of Patents under the Great Seal granted for Inventions, are, I apprehend, in such accordance with the views of the intellectual portion of the community, and with the FEELINGS of the operative classes, that it is a matter of equal regret and surprise, that the genius and inventive talent of the nation should have so long remained without legislative protection.

It is with deference to the experience of Mr. De Jongh, I take the liberty of submitting, that the practical amelioration which he proposes, although in most respects

excellent, do not go far enough *in principle*. The enormous expenses in duties, fees to officers, antiquated perquisites and pretensions, attendant upon the attaching of the Great Seal of England—the scandalous extortion of obliging an inventor to take out several other Patents under other great or little Seals for the same invention, in the several parts of the same realm; (if he meant to obtain even an apparent security against the piracy of his discovery in other parts of his Majesty's dominions)—the absolute robbery of taking Twenty Pounds additional, for the insertion of two names, as joint inventors, and Forty Pounds for three; these and other oppressions and absurdities, *interwoven with and integral to the PRINCIPLE* of issuing Patents, are left untouched by your correspondent.

Nothing short of the introduction of an enlightened and extended system of security at a moderate expense, that shall rescue the ingenuity and talent of the country from the GRIPE of the present system, can meet the exigencies, and satisfy the reasonable and just demands of that large portion of society, which forms the efficient, intellectual, and moral strength of this kingdom.

If such a system could be rendered largely available to the fiscal resources of the state, at the same time that it should by its institutions and arrangement elicit, invite, encourage, and amply protect *every* exertion of inventive genius, whether native or foreign, then, indeed, might we present to the civilized world a proud monument of legislative wisdom; then might we justly claim pre-eminence, and permanently compete with admiring nations in Arts, Manufactures, and Commerce.

The contemplation of the immeasurable reciprocal benefits, which the adoption of such a system would in time effect, cheers the mind. I deem it not visionary, but *practicable*, to the very letter. Clearness in the develop-

ment of principles and in the arrangement of practical details, is all that is necessary to the completion and easy working of the most extended project. I may be allowed here to demur to the principle advocated by Mr. De Jongh, of empowering his new court to reject an application for a Patent, if they judge "the discovery not worthy a Patent." Under the present wretched system of granting a *pretended security at an enormous expense*, it might be mercy to sanguine adventurers to prevent their ruining themselves ; but to legislate for them upon the principle of establishing a court, with the extraordinary power of deciding *a priori*, that a man's intellectual energies are engaged upon a worthless pursuit, and that *he* is not the most capable judge of the means and opportunities he possesses of putting his inventions into action, would be to establish a most obnoxious and arbitrary mental censorship.

Such a court would, in fact say, (according to your correspondent) to "two-thirds or three-quarters" of those who apply for its *protection*—"Your applications are made upon frivolous pretences of valuable discoveries. Your industry and talents are engaged in inadequate pursuits that may ruin you ; we consider the immense expenses attendant upon your obtaining hollow securities, in the form of Chancery Patents—although your claims to your respective inventions are undoubted, they are not worthy of a Patent, (such as it is) and therefore, we will kindly save you the trouble and misery which *MAY result* from your being allowed to follow your own views and arrangements in respect of your discovery." If I have stated your correspondent's principle fairly, as to its actual operation, I conceive it presents the *ne plus ultra* of legislative arrogance. Mr. De Jongh appears not to have given himself sufficient time to estimate the effect of this part of his pro-

posal upon the feelings and acknowledged rights of individuals. *Would he like to form an instance of rejected application?* My views are altogether for giving an **UNLIMITED PROTECTION** (as to its efficacy) to *every bona fide* new discovery, which any man may think worth the prosecuting. Almost every invention must be of *some* utility ; it will lend its assistance, however small, to the general improvement of some one art or manufacture. Upon what principle of justice then should a censorship be established, which would in any degree repress the energies of the intellect ? energies employed in pursuits, that can not by possibility injure society. A censorship of the press would be a mild and beautiful feature in our free constitution, (for the extravagancies of the press may do mischief, and the motives of writers are amenable to the jurisdiction of the commonwealth,) compared to the anomaly of the establishment of a tribunal, empowered to take cognizance of and interfere with a free man's own estimation of what his inventive talent, united to his personal exertions, means, and opportunities may effect.

I submit the foregoing observations with great deference to the matured opinions of others. Although I have the misfortune to differ from your able correspondent, as to the principle upon which a separate court for the adjudication of scientific matters should be established, I may have credit for the motives which direct my attention more particularly to the first point that should engage it, viz. the legal power which may be entrusted to such a court.

I am, Gentlemen,

Your obedient Servant,

VINDICATOR.

ART. VIII.—ON THE LAWS RELATIVE TO 'PATENTS.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—The question of the imperfect and uncertain state of the Patent Laws has been very properly raised in your valuable publication, and has been discussed with propriety and ability. The paper by Mr. De Jongh does credit to his acquaintance with the subject, and it is a “consummation devoutly to be wished,” that it may be useful to the Public, by attracting the attention of those whose station and influence may enable them to propose such alterations in the laws affecting Patents as may place this important species of property on a fixed and permanent foundation.

Of all property to which the statute laws of this country give protection and security, it is a fact that Patent property is the least favoured. An author is secure in the possession of his copyright in perpetuity, and may assign, for valuable considerations, his interest in the work he has originated; and his assignees have the same rights as himself. The discoverers of peculiar medicinal compounds, commonly called *quack medicines*, have the same privilege and security, the property in which descends to their heirs, successors, and assigns; but the Patentee of a valuable invention, by which the Public are most essentially benefitted, the boundaries of science, the arts, and manufactures, extended, and improved, and from which wealth may flow to the country at large, has his exclusive property in the discovery or invention limited to the short term of *fourteen years*, which, as the law now stands, is the utmost extent of the royal grant; and during this short term, he must contrive to get himself remunerated for years, perhaps, of toil and labour, attended with ruinous

expenses: and Patent rights frequently expire before the invention is brought to perfection, or before its merits are fairly known, and duly appreciated.

Unjust, however, as this limitation may appear, and injurious in its consequences as it has often been, (for instance, in the case of Bolton and Watt, who, by great perseverance, and the powerful assistance of friends, at an immense cost obtained an extension of their Patent right by Act of Parliament,) yet it is a much less evil than the precarious tenure by which a Patentee now holds his property.

That the existing statutes are *vague* and *uncertain*, and of *various* interpretation, is a fact that cannot be denied, and frequently leads to expensive law-suits, and sometimes to ruinous results in reference to the parties interested.

The rigid investigation to which the title and specification are subjected, the literal construction of the language, and the technical description, render it difficult for any Patent to stand before a well-directed attack, and more especially under interpretations that are dependant on the uncertain impressions of the court and jury.

The statute of 21 James I. for restraining monopolies, appears to be the foundation upon which the whole of the decisions on the laws of Patents appear to rest; and we may refer to a few of the opinions founded thereon, in proof of our assertion of the uncertain and insecure foundation on which Patent property at present depends.

Lord Kenyon says, (in *Hornblower v. Boulton*,) “The principal objection made to the patent by the plaintiffs in error is, that it is a patent for a philosophical principle only, neither organized or capable of being organized; and if the objection were well founded in fact, it would be decisive, but I do not think so. By comparing the patent and the manufacture, it evidently appears that the

Patentee claims a monopoly for an engine or machine composed of material parts, which are to produce the effect described; and that the mode of producing this is so described as to enable mechanics to produce it. This is something made by the hands of man, and the Patent is good."

Lord Ellenborough (in *Huddart v. Grimshaw*) states, "There are common elementary materials to work with in machinery, but it is the adoption of those materials to the execution of any particular purpose that constitutes the invention."

Mr. Justice Heath (in *Boulton v. Bull*) says, "The grant of a method is not good, because uncertain; the specification of a method, or of the application, is equally so."

Mr. Justice Buller (in the same cause) observes, "A method or mode of doing a thing are the same. A patent cannot be supported for a method only, without having carried it into effect, and produced some *new substance*."

The former of these cases enjoins, that a description of the mode or method by which the machine is to be made and constructed, and the operation performed is essential to a good Patent. The second holds the same doctrine, that the common elementary materials of machinery may be adapted and arranged by method or mode, so as to produce a new invention. In both these cases a full and clear description of the method and mode by which the machine produced is laid as the foundation of a good Patent. The latter opinions appear to go upon the conclusion that a specification for a method is not good; that the claim must be for the substance produced, which is at variance with the former, as they go upon the full and clear description of the method of arranging a machine as essential to the goodness of the claim.

Lord Ellenborough holds, (in the case of *Harman v. Playne*,) that a patent for improvements on a former machine was good, although the specification described the whole machine *without distinguishing the improvements* from the parts of the *old machine* already known; and a verdict goes for the plaintiff. But in the case of *Bovill v. Moore*, Sir Vicary Gibbs holds, that although an invention be new, and beneficial to the public, yet if the plaintiff has in his specification asserted to himself a larger extent of invention than belongs to him, the specification will be bad. If there existed, at the time of taking out the Patent, engines of which the subject of the Patent was only an improvement, the Patent ought to have been for the improvement, and not for the entire machine.—Verdict for the defendant.

This discrepancy of opinion proceeding from the highest authority, is sufficient to show cause why an alteration should take place, and that the laws affecting Patents should be revised, their import defined and fixed, their design and intention clearly expressed and adapted to the circumstances of the times and the improved state of scientific and mechanical invention. The labourer is worthy of his hire, and the inventor or discoverer of a useful machine, manufacture, method or principle, ought to have a reward, suitable and proportioned to the merits of his discovery or improvements, and the property in inventions of this nature when once taken, ought to be made secure and be permanently protected for the time of the Royal Grant, be it longer or shorter, so that investments in Patents shall be made to assume a tangible character.

The proceeding by *scire facias* and by *action for infringement*, are capable of much improvement, and a revision of statutes on which they are founded should take places forthwith; and I fully agree with Mr. De Jongh,

that an entire new court ought to be established, to take cognizance and management of all matters regarding Patents.

A Board of Commissioners might be appointed by the Crown, and they should consist of gentlemen well acquainted with mechanical science generally, and of the arts and manufactures of the country. Such men would be capable of discriminating the merits and practical application of inventions submitted to their inspection, and would be best able to execute with effect, such regulations as may appear best calculated to promote the ends of justice, with a due regard to the several interests, both public and private.

Without attempting to state what the precise alterations in the existing Laws ought to be, I would suggest that when applications are made for Patents, a pretty full description of the intention of the Patentee should be stated, and the Commissioners ought to have the power to refuse a Patent, in the event of their not seeing anything new or useful in the invention. That to prevent favour or partiality, the applications should be sealed and delivered without signature; but should be numbered or marked in such a way, that the Commissioners shall not know from whence they came, or to whom they belong.

Some improvements are brought out with little trouble and expense, an accidental hint or thought may be applied to some useful purpose; others are perfected only by much toil and labour, and at a great expense, both in time and money. The Commissioners ought to have the power to limit the Royal Grant to not less than 10, or more than 30 years; so that the period of remuneration shall bear some proportion to the cost of the speculation.

That amendments and additions to the specification ought to be permitted during the first eighteen months or

two years after the date of the Patent, and that such improvements should be made part of the original grant, and expire with the Patent.

That the fees should be greatly reduced, and the whole expense of taking a Patent limited to £.50. That in cases of Infringement, the Commissioners ought to be first applied to, and such arrangements attempted as they may think the justice of the case shall require; an appeal, however, may be allowed to a higher court, but it is desirable to effect the settlement of questions of this nature without expensive litigation.

In any regulations that are proposed, the utmost attention should be paid to the terms in which such regulations are expressed. The statutes ought to be cleared from all obscurities, as to the term *principle*, and the *organization of principle* or *method*, and the application of *method*, and sundry other *ingenious fictions*, which, however useful to counsel, as a medium to display his tact for making distinctions without difference, serve only to involve in obscurity the truth and justice of a case.

This subject is capable of much expansion and observations in detail, but I will at present leave it to your numerous correspondents, who will doubtless avail themselves of the opportunity you afford, to throw their lights on so important a subject.

I am, Gentlemen,

Your most obedient Servant,

J. RAYNER.

18th Nov. 1828.

King Square, Goswell Road.

ART. IX.—ON THE INVENTION OF MONEY BY THE ANCIENTS
AND ITS HISTORY. BY B. COOK, Esq.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—When you favoured me by the insertion (in your interesting Journal of Arts and Sciences for September) of my third Letter on the Invention of Money, I did intend, on the following month, to have concluded the subject, expecting that I could, in a very cursory manner, have proved that the Scythians were the first inventors of money, and then shown how this invention was introduced among other nations. But in pursuing this enquiry, I found myself incapable of describing a subject of such extent, in so small a compass as I first expected; and, indeed, I have experienced the greatest difficulty in being able to select and condense, as I have done, such a vast mass of history, which exhibited, in a degree, the history of man—his wants—his religion—and his progress in science and the arts.

In the earliest periods of time, we find, upon the coins of India and Persia, the figures of the bull and the lion; both of which were emblems of the sun, under two different aspects. One marked the time when it had disappeared from the heavens, and the earth was left in darkness; the other, when it was glowing in all its splendour, enlightening the world, the effulgent God of Day; and these monies, with such impressions on them, are found all over these two vast countries. Half of the sun's disc only is represented upon the backs of these animals, as representatives and emblems of the Deity that divided this luminary of day between them.

But I have, hitherto, said but little of the method of constructing their money. Now the most ancient money struck in Greece is easily known, from the method used in

making it, because it has *no reverse* ; it appears, they found a difficulty in fixing the coin firmly in the die to receive the stroke of the hammer ; to effect this, they left upon the reverse several elevations, which entered into the plate or matrix, to prevent it from slipping. These points or elevations were numerous in the first monies, but in time, this rude method was exchanged for a surface, a little convex, which served to hold the coin, while the obverse was struck upon it. Upon coins now existing of Syracuse and India, this method is evident.

It appears, that the first Greek monies which had any inscription on the reverse, were cut in after the coin had been struck. The obverse was struck first, and then the coin was put in another die, and struck again, with a reverse ; and this method appears to have been generally adopted by the people of Japan, as well as Greece.

Some of the first medals of Greece had, for a reverse, the head of Apollo, with his lyre ; thus upon the medals of Crete, the head of Apollo appears, who was one of the deities worshipped there ; and because Minos pretended to be descended from Jupiter, he was an object of the highest adoration. Idomeneus, who fought at the Trojan war, also attributed his birth to Apollo, the God of Day ; the eagle, also, is found on the Cretan coins.

I would here observe, that a great quantity of coins and medals of Athens, and other cities, were square ; and indeed, all over Asia and Africa, there circulated not only square money, but octagon money. There also existed in France, in the time of the Emperor Honorius, a square money, made of red copper, upon the reverse of which was struck the figure of the goddess *Moneta*, with the legend *Exacium Solidi*, weighing about four penny-weights ; the form of this money was like the money of Athens.

Upon the money of Thrace we find the head of Apollo, and on the reverse, a griffin; also on some of their medals is represented Jupiter, with an eagle on his hand, and a sceptre; on the medals of Macedonia is represented a horse; upon the medals of Corinth, the face of Minerva is represented, and on the reverse, *the Pegasus*—because she tamed the horse, before she gave it to *Bellerophon*.

The medals of the island of Cos, the birth place of *Appelles* and *Hippocrates*, had the head of *Hercules*, and on the reverse, the figure of a crab; and, indeed, it would lead me to a much greater length of time, and would tire your readers, were I to describe all the different coins and medals of the different cities of Greece, as each city struck different medals, either emblematical of the deity they worshipped, or corresponding with some interesting event belonging to that city.

There was struck a money of a parallelogram shape, at *Paestum*, with a Latin inscription, which proves the time it was made; this ancient Greek city was forced to receive a Roman colony, 465 years after the foundation of Rome, and 289 years before Christ; these Latin medals could not have been struck before this period, which was more than 40 years after the death of Alexander. The square money is never found among the Roman coins, because the spirit that called into existence science and arts at Rome, appears under a different shape to that sublime spirit that gave existence to the everlasting inventions of Greece. If, then, any coins of this shape are found with a Roman legend on them, it is certain they were struck in Greece, and after the time I have named.

I think, from my former remarks, it must appear clearly, that the *Scythians* were the first inventors of money; and after them, *Erichthonius*, *Ithonus* and *Janus*, coined money, long before the Trojan war. If we seek for authority from

Plutarch, he says, that Theseus struck the figure of the bull upon the Athenian money, either in honour of his having conquered the bull of Marathon, or, what is more probable, as an emblem of the deity worshipped at Athens; at all events, money, with this figure upon it, was used in Athens before the war of Troy, for his successor, *Ménesthée*, commanded the Athenians at that celebrated siege. It was on account of the figure of a bull being struck upon this money, that it was called by the name of this animal.

Upon the medals of *Pandosia* (a city of Greece, now destroyed) is the same impression, which was famous in history, for the defeat and death of Alexander King of Epirus, who was killed near to its walls, in the same year that the foundation of Alexandria in Egypt was laid. Now, two of the sons of Theseus fought under Agamemnon, at the siege of Troy, and leading there the Athenian youth—a city of the greatest influence among the other states—it is very likely that the money of their father and others, as well as of other states, which had the same impression, was the money then used by the Greeks, both in gold, silver, and brass; for we find that Homer, in speaking of the arms of *Glaucus*, exchanged for those of *Diomede*, says, that the golden arms of *Glaucus* were valued at a hundred oxen or bulls; and those of brass, of *Diomede*, were only valued at nine oxen. *Iliad*, l. 6, v. 235.

It is very certain it could not be animals that were exchanged as money, but money called by this name; so that in 2,000 years hence, when the money of this country is described as *sovereigns*, it will not be supposed that *sovereigns*, mighty men, kings, were in such plenty, as to be used in making exchanges for things to supply our wants, necessities, or luxuries.

Janus changed the form of the money he introduced.

into Italy, upon which he struck figures; and I am inclined to think, that his first coins were not only round money, but tessera, or money with wings attached to it. It was about the time of Servius Tullius, that the coins of Rome began to take a different figure; the first coins were cast in moulds, with the figures on them very much raised, and rude, and after being made, were adjusted to a certain weight, to correct the errors of casting. These first monies were chiefly of lead; but Numa began to make money of copper, and introduced other designs on it, as all the former coins had only the double head of Janus on one side, with a ship or prow of a vessel on the other. But the coins of Imperial Rome will require much more space than this letter will allow me. I shall, therefore, not enter upon them now, as I have hitherto been only endeavouring to trace the invention of money in the darkest ages of the world, and that very imperfectly, having so little light to guide me in my researches. As I approach nearer the latter times, I hope to give more interest to my subject.

I have endeavoured to show, that most of the earliest coins were struck with some figure representing the power and attributes of the deity they worshipped. Thus, the bull was the emblem of life—of that great animating power that gave life to all things. I have not thought right to name a vast number of other figures struck upon coins, which in this age would be considered indecent, but were not so in those days of darkness, superstition, and error.

There was another money, which had struck on it the figure of the serpent, and which I must not pass over. This reptile was frequently engraved upon the medals of Greece, and was emblematical throughout Asia, and almost all over the world, of the being that gives life. Thus we see exhibited in a *bas-relief*, in the Pagoda of Ele-

phanta, a mystical figure, composed of both sexes, holding in its hand the serpent, supported by the head of a bull. The serpent was also an object of worship in almost all parts of the world*. The middle of the chapel, consecrated by the inhabitants of Japan to the Supreme Creator, is occupied by a vast bason filled with water; a great tortoise of bronze is placed in it, and supports a tree of the same metal, upon the summit of which is elevated the figure of their deity, painted black, because they suppose the creation took place during the night. The tree represents life, and is for this reason embraced by an enormous brass serpent, whose body is supported by four symbolical figures. This worship of the serpent is found on coins of almost all the eastern nations.

It is also to be seen upon many of the medals of Greece, especially those struck by the founders of Colonies. It is upon the medals of the first king of Attica, *Draco*,—upon those of *Cecrops*, the founder of Athens, and these kings are represented with the legs of a serpent. The worship of the serpent joined with the bull, the emblem of supreme power, has been found almost all over Europe. The Druidical temple of Stonehenge, on Salisbury Plain, was a Scythian temple, and dedicated to the worship of the serpent.

These temples, of which many ruins remain to the present time, were generally of an oboliscal form, and composed of immense stones; they were always open to the sky, to indicate that the great Spirit that animated all things could not be confined in buildings raised by puny

* Query; can the serpent here alluded to have any reference to a tradition of the means by which evil was introduced into the world, as recorded by Moses. It has been the practice of many of the benighted nations of the earth to worship the evil spirit, as well as the good. EDITOR.

mortals. The upper part, or sanctuary, was terminated with the figure of an immense serpent.

On some medals of *Commodus*, the Supreme Deity is represented under the form of a bull, as indicative of his supreme power. On the reverse of some of the medals of *Marcus Aurelius* are seen the bull and serpent. On the medals of Persia, and in the works of Zoroaster, this worship was practised. He represents God under the figure of the serpent, and describes him "as the Master of all things—exempt from death—eternal in his duration—without beginning, and without parts."

In order to show why we find so many medals with the figure of the serpent on them, I must be permitted to digress a little, by noticing the worship of the serpent. Upon the temple of Belus at Babylon, according to *Berosus*, was a colossal figure, representing this reptile, with a bull, as the Power that had created all things. Babylon was the capital of Chaldea, and its priests the most celebrated in the world for divination. It was in this country that the ancestors of Abraham lived, who are reproached with this idolatry of the serpent, and that of the goat and bull, (*Gen. xi. 26, Lev. xvii. 7, Exodus, xxxii. 4, Deut. xviii. 11*) and are forbid to consult the Pythons or serpents, or interrogate the dead to know the future. The Pythoness, the witch of Endor, invoked the spirit or shade of Samuel; thus she was supposed to have the power of raising the dead, by the invocations of Python.

The Greeks called this sort of divination *Necromancy*. The serpent was revered as the emblem of the god who gives life, and presides over death, and it was thought that by his means the dead might be invoked, in order to inquire of them the fate of the future.

This divination was unknown in Egypt, whose extreme respect for their dead prevented them from troubling their

repose. It was not, then, in Egypt that the Israelites learned this species of divination, but in Chaldea; and although God had condemned to death those that exercised it, yet it was practised 900 years after the death of Moses. King Josiah, who lived about the 35th Olympiad, and more than 900 years after the death of Moses, abolished the Pythons in the kingdoms of Judah and Jerusalem, and the brazen serpent to which they had offered incense, even in the time of Hezekiah, was broken in pieces by order of this good king, 724 years before Christ, and the golden calves of Bethell, adored by the inhabitants of Samaria, were carried away by the Assyrians at the time of the prophet Hosea, 790 years before Christ. I produce these examples to show how long, and with what attachment, the Jews held the ancient worship of the Scythians.

On the medals of Tartary we find the figure of the serpent; on the reverse of a medal of Tyre we find the serpent encircling an egg; and we find the same figure on the medals of Japan, who, in their cosmogony, say it was the warm breath of the serpent that called into life the first man. In the cosmogony of Phœnicia, *Sanchoniathon* describes "*the first beings as being awaked by a voice of thunder, which spoke to them, calling them male and female on the earth and in the sea; and they began to move.*"

The oracle of Delphos was that of the serpent, and the Pythoness delivered to her inquirers the answer of the serpent-god, although, in after-times, it was called the oracle of Apollo. Phidias, the greatest of all sculptors, who built the temple of Minerva, at Athens, during the reign of the arts, and of Pericles, placed the serpent near the spear of Minerva.

The moving stones, or hanging stones, found almost all over the world, were nothing more than emblems of the worship of the bull and serpent, and which stones are often found represented on coins and medals.

But it is time I had done with the superstitions and coins of these dark ages. I will now finish with them, although it must be evident that I have only been able, (from the small space allowed me in your *Journal*) to skim over a long period of time, picking up now and then, in my rapid flight, from its surface, a grain or two of information, which I have registered, in order to illustrate my inquiry, and endeavour to show who were the first inventors of money, and what kind of money it was that circulated upon the earth. To have entered more fully into the subject, and to have described the thousands of coins and medals of the earliest nations of the world, as connected with their religion, that early religion of the people of the earth, the worship of the bull, the serpent, and the goat—the worship of Baal Peor of Holy Writ—of Bacchus, of Apollo, the Jupiter Olympus of Greece, and the Jupiter of Imperial Rome—which were all parts and portions of the same religion, emblematical of the Power that created, and gives life and light to all things; and to follow it through all its various branches, by all the idolatrous nations, as well as the practice of many of its rites, by the chosen people of God, would, instead of four Letters on this subject, have taken a volume.

I am, Gentlemen,

Your obedient Servant,

BENJAMIN COOK.

Birmingham,
Nov. 19th, 1828.

ART. X.—ON FOUL AIR IN WELLS, &c. BY CAPTAIN FORMAN.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—I have just seen in the paper, an account of the death of two men, by the foul air at the bottom of a well, which they were going to repair.

These accidents are of very frequent occurrence; and I *believe* might, in a great measure, be prevented, if, through the medium of the public prints, the persons who employ workmen for these purposes could be made aware, that the state of the air in confined places might be previously ascertained by a very simple process, which would be attended with very little expense, and no trouble. It is well known, that the same noxious air that destroys life will extinguish flame; and, therefore, if they would only attach a lighted torch or lantern to a long pole or line, and make it precede the workmen, they would discover, by the manner of its burning, whether the entrance of the men would be attended with any danger.

If the torch burnt freely, the men might descend without fear; but, if it went out, the foul air must be pumped out; and for this purpose, a *portable* sucking pump, with air-tight valves, and a ~~leathern~~ *leather* hose of sufficient length to reach the bottom, (which should be soaked in water, previously to use) ought to be kept by the master masons, and other persons, who employ workmen for these purposes.

In mines, and those places where explosion may be apprehended, Sir Humphrey Davy's safety lamp may be used.

If you think my observations, above, likely to be productive of good, I shall be obliged to you to give them all possible publicity. I am, Gentlemen, Yours, &c.

WALTER FORMAN.

Recent Patents.

To SOLOMON ROBINSON, of Leeds, in the County of York, Flax Dresser, for his Invention of Improvements in Machinery for heckling or dressing, and cleaning Hemp, Flax, and Tow.—[Sealed June 16, 1827.]

THE subjects embraced under this Patent are two machines for dressing or preparing flax and hemp; the first contains a series of heckles, which are made to travel along the frame of the machine, and in their course to separate the fibres of the material operated upon, by combing it; the second, in a great measure, resembles a carding engine, and is employed for taking up loose tow from a feeding cloth, and delivering it in the form of sliver, from between two rollers.

The Patentee says, that his invention consists in the application of a machine to the purpose of heckling or dressing hemp or flax, wherein he is enabled to use heckles without back-board, and by that means to bring a more complete and continued series of points to operate upon the strick of flax, during the process of heckling, than has been done heretofore by any other machine; and by the same apparatus, to strip the tow which collects in the heckles more conveniently and effectually, during the process of heckling, than can be done by the methods heretofore in use, and whereby he is enabled to present the strick of flax to the teeth of the heckles in a new manner.

* The hemp or flax having been beaten or crushed, for the purpose of breaking off the boom or woody bark on the outside of its stalk, is then brought to the heckling

machine, for the purpose of having its fibres opened, and all the remaining particles of boom or bark combed off. This machine is shewn in the side elevation, Plate V. fig. 1, and consists of two side standards or frames of cast iron, screwed together by cross rails, carrying the toothed gear, and other mechanism, by which the machine is worked; *a*, is a pair of clamps or frame, in which the strick of flax or hemp is suspended, to be operated upon by the heckles.

The construction of these heckles, and the means by which they are worked, will be best seen in the section of the machine, at fig. 2; *b, b, b*, are the heckles, each consisting of three rows of points, set in a wooden rail, extending across the machine from side to side. The ends of these rails bear in the grooves *c, c, c*, of the side plates *d, d, d*, and are intended to slide along in that groove, which is made parallel with some circular ends. Between the several rows of heckles, there are introduced bars *e, e, e*, which are intended as scrapers, to remove the loose tow from the heckles, as they pass along. These scrapers are made to slide up and down, upon perpendicular guide rods *f, f*, which rods are carried along by their stems, moving in the grooves *c, c*, pushed forward by the heckle rails.

The ends of the bars or scrapers *e, e*, move in an outer groove *g, g*, which is made excentric, so that as the heckles *b, b*, traverse along in the groove *c*, toward the end of their action in the strick of flax or hemp, the scrapers *e*, are made to rise up the rods *f*, and to push the loose tow out of the points of the heckles.

The movements of this machine arise from the axle *h*, which is put into rotatory motion by a rigger and band from a steam engine, or by any other power. Upon this axle *h*, there is an internal spur wheel *i*, shewn in the section, fig. 2, which, by taking hold of the projecting part

or tooth under each heckle, forces the heckles in succession forward in the groove *c*, and by that means drives the guide rods along with them.

In this way the points of the heckles are successively brought under the strick of flax suspended, as already described, at *a*, for the purpose of opening the fibres of the material, and clearing away the boom; and as the points of the heckles collect the tow, the scrapers rise and clear it from them.

It is thought desirable to give a small degree of vibratory action to the strick of flax, in order that it may be occasionally cleaned from the points of the heckles, as the process goes on; this is effected by a train of wheels connected to the main axle.

On the outer end of the axle *h*, there is a pinion taking into a toothed wheel *k*; upon the axle of this last mentioned wheel, there is also a pinion taking into another toothed wheel *l*. At a little distance from the centre of the wheel *l*, there is a pivot, carrying a crank rod *m*, and the reverse end of this crank rod is attached to the lever *n*, to which the clamp, holding the strick of flax, is fastened.

It will hence be perceived, that as the heckles traverse, the wheel *l*, will be made to revolve, and by means of the crank rod *m*, causes the lever *n*, with the strick of flax, to be occasionally raised up, and drawn down, so as to give such a vibratory action as will relieve the fibres of the flax from the points of the heckles.

The operation of heckling is first to be performed by open or coarse heckles, and afterwards by close or fine; it is therefore proposed to combine, in one frame, three such machines as the above described; the lever, *n*, being capable of holding three stricks of flax, one beside the other crossing the machine breadthwise; and when the flax has been sufficiently operated upon by the first series of

heckles, the strick is to be removed to the next, and so on, until the boom is completely removed, and the fibres are perfectly opened.

The second part of the invention is a machine designed for converting the tow thrown off from the preceding heckling process into sliver fit for spinning into yarn. The machine acts in a great measure like the ordinary carding engine, employed for straightening the fibres of cotton and wool. It is shewn in a side elevation at fig. 3.

The Patentee says, that in this machine he is enabled, by a series of parallel divisions, placed spirally or otherwise on the cylinder, to obtain a sliver from the tow; *a*, *a*, is the drum or cylinder, covered with fine pointed wires; *b*, is the feeding cloth, upon which the tow is spread out, and is progressively brought forward to the teeth of the carding or combing drum, by a rotatory motion, which is given to the rollers by means of a connecting band, leading in any convenient way from some of the moving parts.

The large cylinder or drum *a*, is made to revolve by means of a rigger, affixed upon its axle; the fine points upon the periphery of which takes up small portions of the tow as it goes round, in the same manner as the drum of a carding engine.

The peculiarity of the machine is, that the periphery of the drum is divided breadthwise into any required number of spaces, by parallel ribs placed round it spirally, and as the points on the periphery of the drum take up the tow, a cylindrical brush *c*, placed in contact with the drum, presses the tow into the spaces.

When a sufficient quantity of tow has been collected in the points or combs of the drum, its rotation is stopped, and the feeding apparatus is withdrawn, which is done by sliding back the carriage *a*, that supports the rollers of the

feeding cloth. The end of the carding of tow is then raised by hand, from the extremity of the spiral space upon the periphery of the drum, and is conducted between the two rollers *e, e*. The drum is then driven round the reverse way to that in which it took up the tow, and the rollers *e*, being put in motion, the tow is drawn off in a perfect sliver, ready to be twisted or spun into yarn.

It has been said, that the rotation of the drum is produced by a rigger or pulley, on its axle. There are in this, as in most other rotatory engines, two riggers upon the axle of the drum; one fixed to the axle, the other sliding loosely round it. The band leading from the steam engine or other first mover, being readily slidden from the loose to the fixed pulley, or *vice versa*, the engine is by that means put in action or stopped.

When the band is upon the first pulley or rigger, the drum revolves in the direction pointed by the arrow, and is there collecting the tow upon its periphery; the wheel-work mounted upon the sliding carriage *d*, being then in gear, which actuates the feeding cloth and the pressing brush, the wheel-work at *f*, on the opposite side, is at the same time thrown out of gear; but when it is required to wind off the sliver, the band is passed on to the loose pulley, the train *d*, is withdrawn, and the other train *f*, thrown into gear, which is done by lowering the longer arm of the lever *g*, and consequently causing the carriage with the train *f*, to be slidden forward. By means of this train, the drum is made to revolve in the opposite direction, which permits the sliver of tow to be drawn off, and passed between the delivering rollers. [*Inrolled December, 1827.*]

To JOHN COSTIGAN, of Collon, in the County of Louth, in that part of the United Kingdom called Ireland, Civil Engineer, for his Invention of certain Improvements in Steam Machinery or Apparatus.—[Sealed December 13, 1826]

THE subjects of this Patent are various, and apply both to the constructing of steam engines, and the generating of steam. The Patentee says, “in the following description of my invention or improvements on steam engines, or parts of steam engines, I shall have occasion to introduce and describe matters and things, to the invention of which I make no claim, and which form no part of the subject of my patent ; and these things are mentioned in the following description, only because I could not otherwise make the nature and utility of my invention or improvements clearly understood.”

The specification then goes on to describe a rotatory steam engine, a section of which is shewn in Plate VI. at fig. 1 ; *a, a*, represents the steam cylinder ; *b*, is the main rotatory axle. The cylinder is supported by bearings, upon a standard at *c, c*, to which it is firmly bolted ; *d*, is the induction or pipe by which the steam passes from the boiler or generator, to work the engine ; *e*, is the eduction or pipe by which it escapes, after having driven the piston forward, which pipe may lead to a condenser, to a chimney, or to the open air ; *f*, is the rotatory box carrying the pistons (called by the Patentee, the nucleus). This is made of cast iron, and being firmly secured to the central axle, revolves with it ; *g, g, g, g*, are the pistons, floats, or vanes, attached to the central box by hinge joints, on which they turn freely ; *h*, is the steam stop.

The steam being admitted at the pipe *d*, occupies the chamber within the cylinder, and there exerting its elastic force against the steam stop, and against the vane or piston, causes the vane or piston to be driven forward, and consequently the box and the axle *b*, to revolve also. When the piston has reached the eduction aperture *e*, the volume of steam behind it escapes, and the vane falls back, by its gravity, into the recess in the periphery of the box, and the elasticity of the steam acts against the next vane in succession, and so on, carrying the box or nucleus and the axle round, and by a continuation of the vanes brought successively into operation, a continued rotatory motion is effected, the parts being properly packed. This is the ordinary construction of a rotatory steam engine.

The Patentee says, "The whole force of the steam acting in the chamber is exerted against each float individually in succession; consequently they ought to be so contrived, as to have strength and stability sufficient to resist that pressure, and also to turn lightly and with facility on their centres. To answer this purpose, I have invented the method of hanging the floats indicated in the drawing, by a careful inspection of which, and attention to the following explanation, it will be perceived that each float has a small axis in its centre; this axis turns in holes, perforated for that purpose in flanches, which are attached to each end of the nucleus by bolts or rivets."

The flanches are not seen in the figure, but may easily be conceived. "The axis of the floats are of small diameter, but are quite sufficient to sustain the float when folded up in its recess in the nucleus, or while extended across the steam chamber, but when extended, I no longer count on the axis as furnishing any support or strength to the float, which is then held or jointed in the nucleus itself, by the back of the float pressing against a shoulder, and its short

end, next the centre of the nucleus, being stopped by another shoulder.

“ Now it is evident, while in this position, the more the steam presses against the float, the less the latter needs the support of its axis ; but as soon as the float moves forward, so far as to permit the steam which acted upon it to escape by the eduction pipe, it begins to fold itself into its recess, and is then indebted to its axis for support ; until again, in its turn, it is extended to sustain the pressure of the steam.

“ Rotatory engines have been constructed upon various plans, and some of these, in many respects, similar to the above described machines ; I therefore claim no exclusive right to rotative steam engines, cylinders, nucleus, caps, floats, or packings ; and confine the subject of this patent, as far as regards rotatory steam engines, to my improved method of hanging the floats, so as to unite facility of movement with the greatest strength required, and the method not yet described of governing their evolutions ; and to my improved method of preventing the steam from escaping in one direction from the steam chamber, by the stop which enables me to place my packings in grooves *z, z, z*, in the periphery of the nucleus, and to make them act on the uniform polished surface of the stop, avoiding by those means the great breadth of packing, and the excessive friction and wear and tear, which has, hitherto, rendered unsuccessful other rotative engines.”

Fig. 2, is a section of the steam cylinder, taken transversely ; *i, i*, are caps screwed to the flanches, between which there is to be hempen packing or metallic packing, similar to the packing of an ordinary piston. The caps revolve with the nucleus, and are confined within an outer rim, properly packed, in order to keep the steam from escaping. The form of the steam chamber may be varied

at discretion; that is, it may be circular or angular on its edges, or shewn by dots, in fig. 2.

The Patentee says, "As I do not take out my patent for a steam engine, I shall only describe so much of it as is necessary to shew how far my improved steam machinery is applicable and useful in certain parts of steam engines, and set up no claim to those engines, or any parts of them, other than the improvements herein particularly specified as any invention. Now the operations of floats, which I have described, are not new, nor do I make any claim to them, further than my method of hanging them, as before described, and some additional apparatus, about to be explained. I have described the floats as self-acting by their own gravity; but as the floats of a rotatory steam engine are a considerable weight, they would be induced to fall with such force, in opening and shutting, as might greatly injure the machinery."

To remove this inconvenience, the axle of the floats at one end are made to pass through the flanch, and expand sufficiently far to receive a small double-armed lever *k*, (shown also detached at *k* 1,) which, being turned by a cam at proper intervals, cause the floats or vanes to turn into their proper positions, as the box or nucleus goes round, and consequently prevent any accidental retention of the floats or vanes, by the friction in improper positions.

Fig. 3, represents the excentric groove, or cam, by which the levers of the vanes are turned. This groove, or cam, is placed on the outside of the steam cylinder, and is so formed, that its curves cause the levers to turn upon their axles, and work the vanes as the machine revolves. The Patentee says, that he wishes it to be understood that he proposes to use the cam and levers "for the double purpose of obliging the floats, notwithstanding

any tightness of the packing or the joints, to open on entering the steam chamber, and that in doing so it shall not be allowed, however free on its joints, or massive in its construction, to fall with force, or dash itself with violence against the sides of the steam chamber."

The above-described method of moving the vanes or pistons is not absolutely necessary in the construction of rotatory engines, above explained, but in some kind of rotatory engines the Patentee considers that it would be indispensable. For instance, if the central rotatory shaft was placed in a perpendicular position, the vanes would not then be enabled to fall by their own gravity; in that case the levers and cams, as described, would be essential. There is also another variation in the construction of a rotatory steam engine, to which the same is applicable, a diagram of which is shown at fig. 4. This is called, by the Patentee, a double rotatory steam engine, the operations of which are so obvious, upon inspection, that it is not necessary to explain them particularly.

The second head of the invention applies to a reciprocating engine, and is described in these words:—"The piston of a steam engine is a ponderous mass of iron, or other metal, the weight of which, when suspended in a vertical cylinder, and counterbalanced by the connecting rod, and the other end of the beam, is not felt as an evil; but when a steam cylinder is placed horizontally, and the weight of the piston and rod drags continually on the lower side, it creates excessive friction, wears the cylinder oval, and destroys the packing at the lower side of the piston, whilst it soon permits the steam to escape at the upper side. The weight of this apparatus is thus found to be an evil, for which no adequate remedy has hitherto been laid before the public.

“ Now the remedy for this defect in horizontal reciprocating steam engines, is a part of my improved steam machinery or apparatus, which I describe as follows:— Fig. 5, *a*, represents a vertical section of what I call my buoyant piston; for I mean nothing less than to render this piston so buoyant, that I could transfer the friction from the lower side to the top of the cylinder, notwithstanding the weight, however great, of the piston; *a*, is a strong boss of iron, in which the piston-rod is fastened, and on each end of which is fixed an iron plate *b, b*, at any angle that may be desired. These plates are turned, so that even in that position they fit the cylinder as well as those usually placed in it at right angles.

“ The edges of these plates are properly formed to receive packings of hemp, steel, or brass, or any proper mixture of metal. (I prefer to use the latter.) When so packed, these become two pistons, touching at the lower edge, but being some inches apart at the top which forms the compartment *c*. Both pistons are perforated with a small bolt, and the holes are covered by hanging valves, which open outwards.

“ Supposing the steam to be filling the cylinder in the direction of the dart, it will shut the valve, and prevent steam from entering the compartment *c*; and if, through any imperfection of the packing, steam should enter the compartment, it would escape by the valve on the opposite side. It is scarcely necessary to state, that the steam acting at the other end of the cylinder would have a similar effect.

“ Hence, on whichever side of the piston the steam passes, the compartment *c*, between the pistons, always belongs to the exhausted or empty side; consequently, the pressure of the steam acting on the inclined plane of

the piston, not only pushes but also lifts it upwards, in proportion to the inclination given it.

“Having ascertained the weight of the pistons, and rod, and the elastic force of the steam to be used in the cylinder, the inclination of the pistons should be such as would render them buoyant by the elastic force of the steam.”

As the elliptical form of the piston, last described, may be found difficult to make, another construction of buoyant piston is exhibited at fig. 6. In this figure, the pistons are fixed on the rod at right angles, and parallel to each other, and are turned circular, in the usual way. Between the two pistons, two compartments, *c*, *d*, are formed, separated from each other by a horizontal partition. The two pistons have apertures leading to the two compartments respectively, which are closed by pendant valves; those of the upper compartment *c*, opening outwards, and those of the lower compartment *d*, opening inwards. The steam, therefore, occupying the cylinder, and pressing against the piston from either end, will be prevented from entering the upper compartment *c*, but will be readily admitted to the lower compartment *d*, and there, exerting its elastic force upwards, against the middle or horizontal partition, will, if the area of the partition be properly proportioned to the weight of the piston, and the elastic force of the steam, render the pistons, as they move along in the cylinder, perfectly buoyant.

The Patentee says, “I do not confine myself to the two methods above described, of rendering pistons buoyant, nor to the kind of valves there indicated; but I consider the above methods of rendering pistons buoyant by the pressure of the steam acting in the cylinder, however varied or modified, as my exclusive right.”

Another method of obviating the defects of the horizontal cylinder steam engine, has for its object to cause the hori-

zontal steam cylinder to revolve slowly in proper bearings, which shall not prevent the passage of the steam into and out of the cylinder, and by so revolving, will present every part of the cylinder and stuffing box to equal friction and wear. "I make this motion of the cylinder slow, and either continual or periodical; and in the latter case, which I prefer, I cause the motion to be communicated to the cylinder at that almost imperceptible point of time between the steam ceasing to act on one side of the piston, and beginning to act on the other, as the movement of the cylinder will then be effected with less difficulty."

The Patentee then goes on to describe several ways of causing the cylinder to revolve, either by hand or by machinery, which consists in mounting the cylinder as an axle, on fixed bearings; and, if to move by machinery, attaching a toothed wheel to one end, the teeth of which shall take into an endless screw, and this endless screw be driven round by a succession of impulses communicated to it by the traversing of the piston rod, or by any other convenient means, such as those which are employed for opening and closing steam valves.

The last feature of this Patent purports to be a new constructed boiler or generator, for the production of steam. Fig. 7, is a perpendicular section of the boiler or generator, taken longitudinally; and fig. 8, is a transverse section of the same; *a*, is the ash-pit; *b*, the fire-place, formed by iron bars resting on sleepers, as usual; *c*, is a flat vessel of capacity, intended to contain water, which is constructed by riveting iron-plates together, with bars intervening, to keep the plates parallel and at a proper distance apart. Fig. 9, shews the manner in which these bars are proposed to be placed; *d*, is another similarly constructed flat vessel holding water, and in the flue, between these two vessels, there are a series of pipes, *e, e*, placed transversely. At

the top of the flue, a flat vessel *f*, of the same description, is placed, and another in the front at *g*. A reservoir *h*, is also adapted to the back of the fire place, and these vessels and pipes are all to be connected together by small bent tubes, to be attached by flanges and screws to the short pipes, which are seen projecting on the outsides of the several vessels.

The flame and heated vapour from the furnace, in passing through the flue towards the chimney, heats the several vessels above described, containing water, and causes the steam to rise through the tube *i*, at top, into the enclosing vessel *k*, from whence it proceeds, by the pipe *l*, to the engine. This vessel is furnished with a safety valve *m*, and a discharge pipe *n*, through which any superfluous steam may be blown into the air, or passed up a chimney, and any water which may condense in the vessel *k*, may be drawn off by a small cock *o*.

The Patentee goes into an elaborate description of the modes of putting the several parts of this generator together, and of the variations in form and disposition of which it is susceptible; but as the intention is sufficiently obvious from the figures, and the plans are not new, but common to a great many boilers or generators, described in our preceding volume, we consider it unnecessary to enlarge upon this part of the subject.

It may, however, be necessary to point out the Patentee's particular views, with respect to this part of the invention. "The construction of my generator," he says, "which affords such facility of building or re-building, is of great importance, as all the flat vessels are connected by tubes, and ~~can~~, if one side is worn by the effects of fire, be turned, and will then last as long again. And if a few spare vessels are kept for the purpose of changing any that may want repair, the one can be taken out, and the other put into the

apparatus, without any material delay; and when not in use, the form of these vessels enable them to be stowed in so small a volume, that, even on board ship could not render keeping them inconvenient."

In conclusion, he says, "I claim as my invention, or improvement, the above described method or methods of reducing the quantity of water included in my apparatus, and exposed to the action of heat, to the most minute quantity desirable in practice, by the introduction of filling pieces of iron, or other metal into the cavities, or compartments of the same, and so constructing the said apparatus, as that its cavities and compartments shall be easy of access, for so introducing or placing the said filling pieces in their proper positions, and for withdrawing them and cleansing the apparatus, when the accumulation of sediment, incrustation, or other deposit, may render the same necessary."

"By this improved apparatus, I save fuel, occupy little space, and can work with impure or sea water, which would be impracticable when exposed to the heat in minute quantities, without the filling pieces, by means of which I can expose to the action of heat, one eighth of an inch thick, or even less, of water, and when necessary to clean the cavity, I can, by withdrawing the filling pieces, enlarge it, so as to admit of being cleansed with facility."

[Inrolled June 1827.]

To SAMUEL PARKER, of Argyle Street, in the City of Westminster, and County of Middlesex, Bronzist, for his having invented or found out certain new Improvements in the Construction of Lamps.—[Sealed 1 Feb. 1827.]

THE improvements proposed under this Patent are, first, placing an argand lamp in a basin, bowl or vase, of glass, (solid glass, the Patentee says;) secondly, the introduction

of a glass tube called a *coronal*, surrounding the ordinary glass chimney; and thirdly, the mode of raising the wick of the lamp, by turning this coronal round.

Plate VI. fig. 10, is a section of the lamp, and glasses which enclose it; *a, a*, is the glass vase, or bason; *b, b*, is the circular reservoir containing the oil, as usual; a flange on the edge of which rests upon the metal rim set round the top of the glass vase; *c*, is the argand burner, as in other argand lamps; *d*, is the pipe or tube conducting the oil from the reservoir to the burner; *e, e*, is a circular metallic plate, carrying the glass chimney *f*, and the coronal *g, g*. This circular plate is perforated with holes, in order to allow the air to pass up the burner.

The collar round the burner, which confines the circular wick, is cut with a spiral groove within, for the purpose of carrying up the wick, when turned round. Arms of wire, descending from this collar, are attached to the circular plate *e*, and the lower rim of the glass coronal rests upon the plate. A pin, *h*, in the rim of the coronal, drops into a notch in the plate *e*, and thereby locks the coronal and the plate together, consequently turning the coronal by hand causes the plate to turn, and the wick to be raised whenever that may be necessary; *i*, is a stem at bottom of the glass vase, which, by means of the metallic collar surrounding it, enables the lamp to be screwed to a standard.

The cock *k*, has a cylindrical hollow plug, with a partition across the middle. The plug has small holes perforated in its sides, both above and below the partition. When it is required to fill the reservoir *b*, with oil, the plug of the cock is turned, so as to bring the aperture in the upper part of the plug opposite to a corresponding hole in the socket of the cock, communicating with the reservoir; the oil may then be poured in, until the reservoir is full.

By turning the cock the reverse way, the aperture in the lower part of the plug allows the oil to flow from the reservoir, through the pipe *d*, to the burner, and there is a small lateral pipe *l*, for the air to escape through.

The Patentee claims, as his invention, mounting an argand lamp in a solid glass vase, bason or bowl, in the manner described, which enables the lamp to be removed, without the danger of spilling the oil; the adaptation of the glass coronal, opening wide at the top, and freely admitting the air, which keeps it always cool, so that it may be readily turned without burning, or greasing the fingers; and the mode of raising the wick, by a pin at the bottom of the coronal falling into a notch in the circular plate, connected to the collar round the burner, which enables the wick to be raised when required.—[Inrolled April 1827.]

To WILLIAM SMITH, of Sheffield, in the County of York, Merchant, for his Improved Method of Manufacturing Cutlery, and other articles of Hardware; with or by means by Rollers.—[Sealed 20 Feb. 1827.]

THE Patentee says, that in order to understand the object of his improvement, it is necessary, in the first place, to describe the ordinary mode of making knives.

A sheet of steel being provided, the blades of knives are cut out of the sheet, and the backs, shoulders, and tangs, of wrought iron, are attached to the steel blades, by welding at the forge. The knife is then ground to the proper shape, and the blade polished and hardened.

Instead of this welding process, the Patentee proposes to make the knives entirely of steel, and to form them by rolling in a heated state between massive rollers, the shoulders or boulders, and the tangs for the handles

being produced by suitable recesses in the peripheries of the rollers.

When the knife is to be made with what is called a scale tang, that is a broad flat tang, to which the handle is to be attached in two pieces, riveted on the sides of the tang, the rollers are then only to have recesses cut in them, in a direction parallel to the axis for forming the bolster.

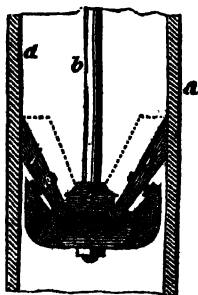
The plate of steel having been heated, is to be pressed between the two rollers, by which the blades and the parts for the scale tangs will be pressed out flat and thin, and those parts which pass between the grooves or recess will be left thick or protuberant, forming the bolster for the shoulder of the blade. But if the tangs are to be round in order to be fixed into handles, then it will be necessary also to form transverse grooves in the rollers, that is, at right angles to those which give shape to the bolsters, the transverse grooves corresponding in length to the length of the intended tang.

When the plates of steel have been thus rolled, forming three or more knives in a breadth, the several knives are to be cut out by the ordinary mode of what is called slitting, and the blades and shoulders ground, hardened, and polished, in the usual way.

It is in the contemplation of the Patentee to make rasps for shoemakers by similar means, that is, to roll plates of steel between excentric rollers, which will form the rasps, tapering at the ends. After they have been so rolled, they may be roughed by the chisel in the usual manner, and afterwards hardened.—[Inrolled August 1827.]

To JOHN WHITE, of Southampton, in the County of Hants, Engineer and Iron Founder, for his having invented certain Improvements in the Construction of Pistons or Buckets for Pumps.—[Sealed 1 Feb. 1827.]

THIS improved piston or bucket is designed for a pump, the barrel of which is square. The novelty consists principally in the mode of mounting and securing the valves in their seat; that is, attaching them to the plunger.



The figure in the margin represents a bucket or piston upon the improved principle, as it would appear when moving in the barrel; *a, a*, are the sides of the barrel shewn in section; *b*, is the pump-rod; *c*, the box or plunger; *d, d*, the valves.

The box or plunger *c*, is proposed to be made of cast iron, with semi-cylindrical recesses for the cylindrical back parts of the valves also of cast iron to work in, forming a sort of hinge joint. A cap, *e*, which screws on the pump-rod, confines the valves in their places, leaving them only room to vibrate; *f, f*, are wings of iron, affixed to the sides of the box or plunger, at the upper part of which a small stud is placed, for the adjusting screw to strike against when the valve falls. By means of these screws, the valves are adjusted so as to fall exactly into close contact with the sides of the pump-barrel.

The particular advantage contemplated by the Patentee in this construction is, that the edges of the valves, and their bearings against the regulating studs, will wear together, and always keep in good condition.

In order to keep the sides of the bucket air-tight, thick pieces of leather are to be attached to the valves, as shewn by dots; the curved recesses on the sides of the pump-box being made for the curved ends of the leathers to work in.—[Inrolled, August 1827.]

To WILLIAM DICKINSON, of *Bridge Street, Southwark, in the County of Surrey, Tin-Plate Merchant, for his Invention of an Improved Buoyant Bed or Mattress.*
[Sealed August 13, 1827.]

THE principle object of the Patentee is, to construct a seaman's bed or mattress, which, while it possesses all the advantages of elasticity common to other beds or mattresses, shall also have the property of being buoyant in the water, and therefore may be resorted to as a means of saving the life of an individual in case of shipwreck.

A piece of ticking, cut to the dimensions of the intended bed, (say for one person) is to be spread out flat and thin, and about four and a half pounds of horse-hair carefully and evenly distributed over it; upon the horse-hair, thin of cork are to be laid in several thicknesses. About five pieces pounds of cork, cut into sheets one eighth of an inch thick, will be sufficient. Over the cork, another similar quantity of horse-hair is to be distributed evenly, and then a piece of ticking, as before, spread out, and covered over the whole. The edges, that is, the sides and ends of the bed or mattress, are then to be closed by sewing, as usual, and the internal parts secured together by stitching through and through.

The bed, thus made, will possess all the elasticity necessary for sleeping upon with comfort, and in the event of any accident at sea, the sailor, to whom the bed

belongs, may strap it round his body and carry it about him, without inconvenience; until it may be necessary for him to save his life by swimming, when being thus prepared with a buoyant material, he may jump into the water, and will float without any personal exertion.

Beds of this description may be made with flocks, wool, or other materials in place of horse-hair, the thin sheets of cork applied to the purpose of forming the basis of the bed being the particular feature of novelty claimed. It is also to be observed, that beds, pillows, seats, mattresses, and other cushions for ordinary purposes, may be made in the same way, and will possess the advantages of being very light and healthy to sit or recline upon.—[*Patented February, 1826.*]

To JOHN BROWN and WILLIAM DUDERIDGE CHAMPION, of Bridgewater, in the county of Somerset, Merchants and Copartners, for their having found out and discovered a certain composition or substance, which may be manufactured or moulded, either into Bricks or into Blocks of any form for Building, and also manufactured and moulded to, and made applicable for all internal and external ornamental architectural purposes, and for various other purposes.—[Sealed May 5, 1827.]

THE bricks and other articles proposed to be manufactured from this new compound, are intended to resemble those commonly called *Bath bricks*. The compound is to consist principally of a foamy deposit, formed in the river Parret, within a mile or two, both above and below the town of Bridgewater, which is to be mixed with a small quantity of clay and sand.

It is of very considerable importance to the perfecting of the articles intended to be made from this new compound, that the materials should be minutely broken, and blended together without lumps. It is therefore directed, that when the materials are ground in an ordinary pug-mill, that great care be taken to bring the whole under the operation of the knives or cutters, and it is suggested, that it would be advisable to introduce other cutters into the mill, to work between the ordinary cutters.

After having been broken by the pug-mill, it is thought desirable to reduce the material still finer by the hand operation of grinding upon a stone with a muller, and indeed to go through that operation two or three different times, until it is reduced to the finest condition.

The materials being then mixed up with such a quantity of water, as shall enable the mass to work freely, but stiff, the bricks or other articles to be made, may then be formed by moulding, as ordinary bricks are moulded; or any other forms, such as vases, cornices, blocks, and various architectural devices and ornaments, may be produced in the same way. It should, however, be observed, that if too much water be mixed with the materials, that the articles will be subject to get out of form in drying. Pressure should be applied in moulding the material, and it is proposed by the Patentees to employ a stock for this purpose, but of what construction, is not shewn.

After moulding, the articles are to be placed upon boards to dry in the air, under a shed, taking care that the drying is gradual, else they will be subject to crack, and when perfectly dry, they are to be baked as other articles of pottery, in a kiln or oven.

Some care is necessary in the selection of the clay, which is to be mixed with the other materials, as different kinds of clay will produce variations in the colour of the

brick when baked, some being lighter and others approaching to a dark red. The small quantity of salt which may be mixed with the loamy deposit, after the articles have been baked, will be so inconsiderable, as to be no detriment to the bricks, if employed for the purpose of building.—[Enrolled July, 1827.]

To THOMAS BREIDENBACH, of Birmingham, in the County of Warwick, Merchant, for his Invention of certain Improvements on Bedsteads, and in making, manufacturing, or forming Articles to be applied to, or used in various ways with Bedsteads, from a Material or Materials hitherto unused for such purposes.—[Sealed 13 August, 1827.]

THE improvement proposed consists in the employment of woven metallic wire gauze, which is to be applied to various parts of a bedstead, that is to form the sacking, the tester, and the back; and in place of hangings, or curtains, to enclose the sides and end.

The object proposed by the employment of woven metallic wire gauze, is to prevent the harbouring of vermin in the bedstead, or its hangings; but it must be obvious that the invention is most particularly applicable to tropical climates, where a free circulation of air is desirable; and at the same time it is absolutely necessary to close every avenue by which musquittoes or other insects, or snakes, could approach the persons sleeping.

In adopting this metallic gauze, in place of the sacking, tester, or head of the bedstead, the wire may be woven in a panel, and its edges made fast to the posts and rails of the bedstead, whether of wood or metal; but in applying the metallic gauze to the hangings or bed furniture, it is

necessary to join the edges of the sheets of gauze together, by sewing them with wire, and thereby forming hinges.

The several pieces or pannels of gauze, may by these means be made to fold together, and the hangings may, in that way be opened or closed, and every aperture for the ingress of musquittoes or other insects or reptiles, will by those means be rendered perfectly secure, and the persons sleeping inaccessible.—[Inrolled February, 1828.]

TO GEORGE POULTON, of Stafford Street, Old Bond Street, in the County of Middlesex, Tailor, for his Invention of an Instrument, Machine or Apparatus, for Writing, which he denominates a Self-supplying Pen.—[Sealed 4 July, 1827.]

THIS invention is said to consist of three parts; a tube or reservoir, a pen, and a shield. These, the Patentee says, may be employed together, or separate.

The tube, or reservoir, to contain the ink, is proposed to be made of gold or silver, that it may be kept free from corrosion, and within it a small weight or plunger is to act, for the purpose of expressing the ink by its gravity, through a valve at bottom. The pen, which is made of steel, is to be screwed to the reservoir, and should be coated with metal, to prevent its rusting, and over all a shield is to be slidden, to enclose and protect the pen.

No drawing is appended to this specification, therefore we are unable to give a more perfect description of the invention.—[Inrolled January, 1828.]

Nobel Inventions.

Towing Vessels by Steam Power.

A CORRESPONDENT in the North sends us the following account of some interesting experiments on the application of *Steam Tracking* to inland navigation, made lately on the Forth and Clyde Canal. The notes were taken, we understand, by a gentleman who was present, and their accuracy merits the most entire confidence.

The result is unquestionably important, as it shows that with moderate speed, *Steam Tracking* may be advantageously applied to inland navigation. It will be seen, that with the velocity commonly employed in the case of coal boats, one hundred weight of coals per hour (costing about 4*d.*) does the work of nearly four horses, without injury to the canal. If we estimate the *keep* of the horses at 3*s.* 6*d.* each per day, the expense of tracking by steam would be to that of tracking by horse power nearly as one to four, exclusive of the original cost of the engine. The action of the paddle seem to have very little effect on the surge, which depends almost entirely on the speed of the boat, whether dragged by horses or steam.

“ The steam boat employed in the experiments was one of ten horse power, built for a ferry boat, and having its paddle wheels at the sides—its regular performance in open water is 36 strokes per minute—fuel about one cwt. per hour.

“ *First experiment.*—The steamer had nothing in tow; the engine made 34 or 35 strokes a minute (according to the width of the canal), and the speed of the boat was at the rate of six miles per hour.

“ The surge on the bank was considerable, and such as would be destructive, unless the canal were faced with stone.

“ *Second experiment.*—Three coal scows, containing in all about 90 tons of coal, were taken in tow: the engine made about 18 strokes per minute, and a mile was performed in 21 minutes, or under three miles per hour. The surge trifling.

“ *Third experiment.*—One of the scows was detached. The engine made 22 to 24 strokes, and the speed of the vessels was increased to a mile in $17\frac{1}{2}$ minutes, or rather less than $3\frac{1}{2}$ miles per hour. Surge moderate.

Fourth experiment.—A vessel of the largest size, capable of passing the locks, and drawing the full depth of them (but having only 65 tons of cargo), was linked to a coal gabert, having 47 tons aboard, and both were taken in tow. A mile now occupied $41\frac{1}{2}$ minutes, or less than $1\frac{1}{2}$ miles per hour. No surge.

“ *Fifth experiment.*—The above vessels were cast off from the steam boat, and five horses were yoked to them by the usual hauling lines. A mile in this case occupied 34 minutes, or about $1\frac{3}{4}$ miles per hour.

“ During this mile, the horses were exerting at more than their average rate, but as the canal in this part was winding and unfavourable, the times $41\frac{1}{2}$ and 34 minutes may be taken inversely as the fair ratio of performance in the two cases.

“ It appears from these experiments, that tracking by steam power is much cheaper than by horses, and if on further investigation, it be found that the inconveniences now experienced in its application can be obviated by proper arrangements, great advantage will arise from its use on such canals where locks do not interfere too frequently.”

The propelling of vessels by steam, though a subject which has occupied the attention of the mechanical world extensively for several years past, appears at this moment to have lost none of its interest, nor the powers of invention, as applied to that object, to be yet exhausted. There are now, no less than *seven* Patents in progress for improvements, applicable to propelling, all of which are dissimilar in their *modus operandi*, and some of them, in our opinion, possess considerable ingenuity.

The great objection to propelling vessels on canals by steam power, appears to have arisen from the considerable agitation which the water experiences by the action of the paddles. We have every reason to believe, that a plan, which has been tried with considerable satisfaction to the projector, will shortly be before the public, by the employment of which these objections will be completely obviated; besides other advantages being gained of considerable importance.

Improved Globes.

Major Muller, of Hanover, Librarian to His Royal Highness the Duke of Cambridge, has recently obtained a Patent, in England, for improved modes of mounting artificial globes, which are designed to solve a variety of problems in astronomy, spherical trigonometry, and navigation, with much greater precision than can be effected on globes mounted in the ordinary way; beside which, the wooden horizon being dispensed with, and the globes suspended in a more independent way, the real and apparent movements of the earth and the heavens will be more rationally represented, and it is supposed, more easily comprehended by the tyro in science.

We refrain from describing the peculiar construction of these globes until the Patentee has deposited his specification. When that is done, we shall give an early report of the improvement, with such remarks as the subject may, in our estimation, merit.

SPECIFICATIONS OF AMERICAN PATENTS.

(From the Franklin Journal.)

To W. MAGAW, of Meadville, Pennsylvania, for making
Paper of Straw.

TAKE any quantity of straw, and boil it in water with salts of ley, pot or pearl ash, in the following proportions. To one hundred and fifteen pounds of straw, add from fifteen to twenty pounds of the salts of ley, and boil it about thirty minutes, then draw off the water, and put the straw into a common paper engine, to be manufactured like rags into paper.

The improvement or discovery consists in preparing straw, hay, or other vegetable substances, for the manufacture of paper in the following manner:—Take any quantity of straw, hay, or other vegetable substances, and boil it in a solution of salts of ley, pot or pearl ash, or other alkali, or lime, in the following proportions, viz. To one hundred and fifteen pounds of straw, hay, or other vegetable substance, add from fifteen to twenty pounds of salts of ley, pot or pearl ash, or other alkali, or lime, and boil them about thirty minutes, or steep the materials in the solution a few days, or until saturated; then draw off the water, and put them into a common engine, to be manufactured into paper like rags.

The discoverer claims as his exclusive improvement or discovery, the materials, and the mode of preparing the straw, hay, or other vegetable substances, so as to render them fit for the manufacture of paper.

To JAMES P. ALLAIRE, for a Steam Chimney or Receiver.

THE improvement is an application of the heat, that usually passes up the chimney and is lost, in such a manner to the steam after it is generated, as to rarify or still further expand it. It consists of a steam chimney or receiver, so constructed that the steam generated in the boiler must, when used, pass over or by the heated metal of the fire chimney, in such quantities only as is necessary to supply the engine.

The space from the external part of the steam chimney or receiver, to the external part of the fire chimney, being small, each renewed supply of steam passing through the steam chimney or receiver is brought in contact with the heated metal of the fire chimney, which imparts the extra heat in the metal to the steam, thereby keeping the temperature of the steam used nearly up to that of the metal of the fire chimney, and also preserving the metal from oxidation or burning.

As the improvement consists in passing the steam over or in contact with the heated metal, to promote expansion, without exposing it to oxidation, the fire may be applied outside of the steam as well as inside, by having the conductor of the steam of a suitable size, and surrounded by fire.

It may be useful for distilling, heating rooms, &c.

American Patents,

FOR INVENTIONS AND IMPROVEMENTS,

Granted in the United States from Nov. 1827, to Feb. 1828.

(Continued from page 47.)

In the making of ornamental hair combs, termed by the manufacturer *side and neck combs*; Uriah Bailey, West Newbury, Essex county, Massachusetts, Nov. 15.

In the hydrostatic steam cradle, for raising and transporting ships or vessels, of any size or weight, over bars and shoals; Charles Miner, of Lyne, Conn., Nov. 16.

In rolling the backs of tortoise-shell combs; Nath. Bishop, of Dunbury, Conn., Nov. 17.

In an invention, or machine, by him called the frame chain; David Leslie, of New York, Nov. 19.

In making leather water proof; David Kizer, of New York, Nov. 19.

In the mill for sawing timber, called the reciprocal saw mill; Wm. Kindall, jun. of Waterville, Kennebeck county, Maine, Nov. 23.

In the machine for washing clothes, and shelling corn; Benj. Rice, of Denmark, Lewis county, New York, Nov. 23.

In a machine for using the escape steam of an engine; Davis Ambree, New Richmond, Clermont county, Ohio, Dec. 3.

In the machine for turning rake and hoe handles; Wm. Shephardson, and Josiah C. Sperry; the former of Hamilton, Madison county, and the latter of Camden, Oneida county, New York, December 3.

In the vest spring, and stiffener; J. G. Shute, Boston, Dec. 5.

In four-wheel carriages; Theodore Brooks, and Daniel W. James, Rutland, Jefferson county, New York, Dec. 6.

In the copper puncher; Wm. Ballard, Boston, Dec. 6.

In a machine called the windlass pegging jack; S. Nourse, Danvers, Essex county, Massachusetts, Dec. 8.

In breaking flax; Henry Schoonhoven, town of Pulteney, Steuben county, New York, Dec. 11.

In hanging or slinging the fore, main, and mizen yards of a vessel; Isaac Carver, jun. Prospect, Waldo county, Maine, Dec. 11.

In the saw mill; Benj. Overman, Greenboro, North Carolina, Dec. 11.

In the grist mill ; James Robinson, of Buckshiu township, Ross county, Ohio, Dec. 11.

In warming and heating rooms ; Archibald M'Allister, and John Iggett, of Salem, Washington county, New York, Dec. 15.

In the common hand rake, for raking hay ; Ambrose Foster, of Auburn, Cayuga county, New York, Dec. 19.

In cutting fur ; Michael Petre, of Womelsdorf, Berks county, Pennsylvania, Dec. 20.

In the tread wheel ; Cornelius Watson, of Addison township, Gallipolis county, Ohio, Dec. 22.

In propelling vessels ; Elijah Bryan, of New York, Dec. 22.

In distilling ; James Lusk, of Butler county, Ohio, Dec. 22.

In spectacles, and single eye glasses ; S. Newton, Washington, D. C. Dec. 22.

In the Barshear plough ; Eli Pugh, of Chatham county, North Carolina, Dec. 24.

In the machine for turning rake handles ; Anson Sperry, of Rotterdam, Schenectady county, New York, Dec. 26.

In a machine called the sliding-plane turner ; Jon. Sparrow, of Portland Maine, Dec. 26.

In spinning cotton ; John C. Dewees, of Mason county, Kentucky, Dec. 28.

In the mortising machine ; Abel Greenleaf, and Hollis Amidon, of the town of Mexico, Oswego county, New York, Dec. 28.

In cast iron sheeves for shipping ; Frances Seymour, administratrix of Benjamin Seymour, of Plymouth, Massachusetts, Dec. 29.

In the plough ; Bird Murphy, of Union district, South Carolina, Dec. 31.

In the saw mill ; William Kindall, of Waterville, Maine, Dec. 31.

In gates for locks, Daniel Rogers, of Little Falls Town, County of Herkimer, New York, Jan. 4.

In the hydrostatic elevator, James M'Creary, of Nobles-town, Alleghany county, Pennsylvania, Jan. 5.

Improvement called a fluid agitator, or churning machine ; Samuel H. Baker, of Wells Township, Bradford county, Pennsylvania, Jan. 10.

In manufacturing artificial stone, Robert M'Kay, Donald M'Kenzie, and Joseph Woodhull, Caledonia, Livingston county, New York, Jan. 16.

In the tubular steam generator, Reid R. Throckmorton, New York, Jan. 17.

In the machine for dressing flax and hemp, John C. Wenzle, of Louisville, Kentucky, Jan. 17.

For sundry methods, by which inflammable gasses may be

generated during the combustion of anthracite coal, Minus Ward and Richard Wilmot Hall, of Baltimore, Jan. 19.

In the common turning lathe, Jefferson Moore, of Leverett, Franklin county, Massachusetts, Jan. 19.

In the vibrating machine for knapping cloth, Samuel Duncan, of Northampton, Montgomery county, New York, Jan. 21.

In making water proof cloth and water proof leather, J. L. Comstock, of Hartford, Connecticut, Jan. 21.

In the floating excavator, Harvey W. Campbell, of Lockport, New York, Jan. 22.

In the mode by which the yards of ships, or vessels are suspended, topped, and braced, Samuel Adams Wells, of Boston, Jan. 23.

In manufacturing barrels, hogsheads, &c., William Adams and Marcus Adams, the former of Ogden, Monroe county, and the latter of East Bloomfield, Ontario county, New York, Jan. 24.

In the machine for mortising, John J. Kellogg, of Richmond, Oswego county, New York, Jan. 24.

In the spring saddle, Thomas Harvey, of Middletown, Delaware, Jan. 24.

In the screw water wheel, Ebenezer Beard, of Charlestown, Massachusetts, Jan. 25.

In the plough, William Ward, of Avon, Livingston county, New York, Jan. 26.

In the cooking stove, Robert C. Rouse, of Athens, Green county, New York, Jan. 26.

In the construction of presses for hay, &c., Moses B. Bliss, of Pittstown, Kennebeck county, Maine, Jan. 26.

In the grist mill, William L. Taylor, of McMinn county, Tennessee, Jan. 28.

In making brick, David Rising, of the town of Colchester, Chittenden county, New York, Jan. 29.

In the steam engine, Simcon Broadmeadow, New York, Jan. 29.

In the steam engine, William Willis, of Charlestown, South Carolina, Feb. 1.

In making an oil paint for painting plastered walls in houses, Alexander Thompson, of Betheney, Genessee county, New York, Feb. 2.

For a medicine, entitled improved rheumatic pills, Ezra Deane, of Biddeford, Maine, Feb. 2.

In the manufacture of combs, Uriah Bailey, of West Newbury, Essex county, Massachusetts, Feb. 2.

For a medicine, entitled a remedy for dysentery, dyspepsia, jaundice, and all bilious complaints, Truman Powell, of Burlington, Chittenden county, Vermont, Feb. 2.

In the machine for packing cotton, William J. Cocke, of Cabin Point, Sussex county, Virginia, Feb. 4.

In the machine for distilling spirituous liquors, &c., William J. Cocke, of do. do. Feb. 4.

For an improvement in stoves, chimneys, furnaces, and steam engines, John James Giraud, of Baltimore, Feb. 10.

In the excavator, or self-loading cart, Waldren Beach, of Philadelphia, Feb. 5.

In the printing press, John C. Holbrook and Elihu H. Thomas, of Brattleborough, Vermont, Feb. 7.

In the machine for junking ivory, by the aid of water, steam, &c., Linus Pratt and Fenner Bush, of Meriden, New Haven county, Connecticut, Feb. 9.

In making hubs, or naves for carriage wheels, called the Hercules hub, Hercules Thomas, of the Town of Midway, Norfolk county, Massachusetts, Feb. 8.

In the machine for breaking and dressing flax and hemp and hulling grain, Evans Christian, town of Philadelphia, Jefferson county, New York, Feb. 8.

In thrashing grain and grass seed, and breaking flax, David W. Webster, of Amesburg, Massachusetts, Feb. 9.

In the machine for cutting straw, Warren Cummins, of Livingston county, New York, Feb. 11.

In the steam engine, Isaiah Jennings, New York, Feb. 11.

In the grailing machine, Philo Pratt, of Meriden, Connecticut, Feb. 12.

In slitting ivory into plates for combs, do. do. do.

In the specific steam engine, Augustus S. Kirk, of Smithfield township, Jefferson county, Ohio, Feb. 13.

In separating and collecting gold and silver from ores, earth, &c., William H. Folger, Spartansburg district, South Carolina, Feb. 13.

In a machine called the apple grater, Uri Emmons, of New York, Feb. 13.

In the canal steam boat, John F. Wight, of Erie, Pennsylvania, Feb. 14.

In the cooking stove, Ezekiel E. Bennett, of Kingsbury, Washington county, New York, Feb. 15.

In lotteries, William E. Spalding, of Brooklyn, Windham county, Connecticut, Feb. 15.

In the thrashing machine, Elias B. Hort, of Charlestown, South Carolina, Feb. 18.

In the machine for cutting, sawing, and polishing marble, Archibald M'Allester, town of Salem, Washington county, New York, Feb. 18.

In the machine for swingling flax, Samuel Achey, of Heidelberg township, Lebanon county, Pennsylvania, Feb. 18.

In the water wheel, Joseph Torry, of Revana, Portage county, Ohio, Feb. 20.

In the mode of fastening window shutters, Truman Bartholomew, of New York, Feb. 19.

In the hammer for cutting and dressing granite and other stones, Joseph Richards, of Braintree, Norfolk county, Massachusetts, Feb. 20.

In the manufacturing or preparing cotton yarn wicks, used in making candles, George Dickinson, of New York, Feb. 21.

In the spiral water wheel, James Kelly, of Jackson county, Ohio, Feb. 21.

In the mode of purifying water, Christopher Hall, of Norfolk, Virginia, Feb. 22.

In the thrashing machine, Edmund Warren, of New York, Feb. 22.

In cast iron window sashes, Isaac M'Nara, of Stafford, Tolland county, Connecticut, Feb. 23.

In steam boilers for using stone coal, James G. Wilson, of New York, Feb. 22.

In the machine for spinning wool, flax, and hemp, Theodore Thomas Abbot, of Greenland, Rockingham county, New Hampshire, Feb. 26.

In manufacturing shovels, Elizabeth H. Bulkeley, Colchester, Connecticut, widow of Chauncey Bulkeley, deceased, Feb. 28.

New Patents Sealed in 1828.

[Owing to His Majesty's Indisposition, the Sign Manual could not be obtained to any Papers of a private nature since August, until within these few Days; consequently no Patents have passed the Great Seal this month.]*

METEOROLOGICAL JOURNAL, FOR OCTOBER AND NOVEMBER 1828.

1828.	Thermo.		Barometer.		Rain in in- ches.	1828.	Thermo.		Barometer.		Rain in in- ches.
	Hig.	Low	Hig.	Low.			Hig.	Low	Hig.	Low.	
Oct.						Nov.					
26	53	31	30,22	30,16		11	34	23	29,56	29,84	
27	54	46	30,11	30,09		12	37	*12	29,56	Stat.	
28	53	46	30,36	30,32		13	47	26	29,69	Stat.	
29	53	33	30,38	30,30		14	50	33	29,69	29,33	
30	47	35	30,24	30,32		15	51	40	29,33	Stat.	,9
31	49	27	30,22	Stat.		16	53	41	29,30	29,22	,325
Nov.						17	50	44	29,71	29,50	
1	54	38	30,20	30,16		18	47	37	29,86	29,83	,25
2	55	43	30,17	30,16		19	48	34	29,96	29,82	,075
3	50	34	30,26	30,22		20	52	39	30,06	29,96	
4	50	32	30,18	30,12		21	54	46	29,92	29,87	
5	46	30	30,11	Stat.		22	50	47	29,77	29,76	
6	49	30	30,06	30,03		23	49	29	29,91	29,85	,1
7	50	37	29,96	29,90		24	52	32	29,72	29,66	,05
8	40	33	29,89	29,83		25	53	33	29,86	29,82	
9	47	28	29,70	29,66							
10	39	27	29,49	29,48							

* The extreme cold of the morning of the 12th, when the Thermometer was 20° below the freezing point, is worthy of particular remark.

LOWER EDMONTON.

CHARLES H. ADAMS.

Lat. 51° 37' 32" N.

Long. 3° 51' W. of Greenwich

CELESTIAL PHENOMENA, FOR DECEMBER 1823.

P. H. M. S.		P. H. M. S.	
1 0 0 0	☉ before the Clock 10' 38"	13 11 0 0	♊ in conj. with 1 ♉ in Scorpio.
3 13 0 0	♀ in conj. with λ in Virgo.	13 12 0 0	♊ in conj. with 2 ♉ in Scorpio.
3 13 0 0	☾ in conj. with ♀ long. 2° in Libra.	15 0 0 0	☉ before the Clock 4' 25"
	☾ lat. 1° 27' N. ♀ lat. 2° 8' N. diff. lat. 41'	15 1 0 0	♊ in conj. with ε in Pisces.
3 16 0 0	☾ in conj. with λ in Virgo.	15 21 0 0	♊ in conj. with ε in Pisces.
4 6 0 0	♂ in conj. with 4 ♄ in Libra.	18 19 0 0	♊ in conj. with 1 ♄ in Taurus
5 0 0 0	☉ before the Clock 9' 1"	18 20 0 0	♊ in conj. with 2 ♄ in Taurus
5 1 0 0	☾ in conj. with 4 ♄ in Libra.	20 0 0 0	☉ before the Clock 1' 58"
5 3 0 0	☾ in conj. with ♄ Long. 22° in Libra.	20 7 0 0	♊ in conj. with ♄ in Scorpio.
	☾ lat. 3° 9' N. ♂ lat 2° 8' N. diff. lat. 1° 1'	20 18 28 0	Ecliptic opposition, or ☉ Full Moon.
5 10 0 0	☾ in conj. with ♄ in Libra.	21 1 0 0	♂ in conj. with ♄ in Aquarius
6 16 14 0	Ecliptic conj. or ☉ new moon	21 7 22 0	☉ enters Capri.
9 17 0 0	♀ in conj. with ♊ long. in ♄ lat. ♊ lat. diff. lat.	23 6 0 0	♀ in conj. with ♄ in Oph.
9 21 0 0	♊ in conj. with ♄ in Capri.	24 3 0 0	☾ in conj. with 1 α in Cancer
10 0 0 0	☉ before the Clock 6' 48"	24 4 0 6	☾ in conj. with 2 α in Cancer
10 6 0 0	♀ in conj. with 1 ♉ in Scorpio.	24 21 0 0	☾ in conj. with ξ in Leo.
10 6 0 0	♂ in conj. with 2 ♉ in Scorpio.	25 0 0 0	☉ before the Clock 32"
11 10 0 0	♂ in conj. with ♄ in Scorpio.	25 2 0 0	♊ in conj. with ε in Leo.
11 22 0 0	♊ in conj. with δ in Aquarius	25 12 0 0	☾ in conj. with π in Leo.
12 12 0 0	♂ in conj. with λ in Aquarius	26 17 0 0	♀ in conj. with 1 ♉ in Scorpio.
13 9 39 0	♊ in ☐ first quarter.	26 17 0 0	♀ in conj. with 2 ♉ in Scorpio.
		28 0 0 0	♀ in conj. with ♄ in Scorpio
		28 22 41 0	☾ in ☐ or last quarter
		30 0 0 0	☉ before the Clock 2' 59"

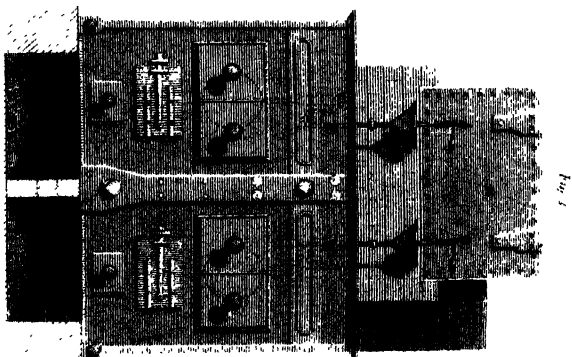
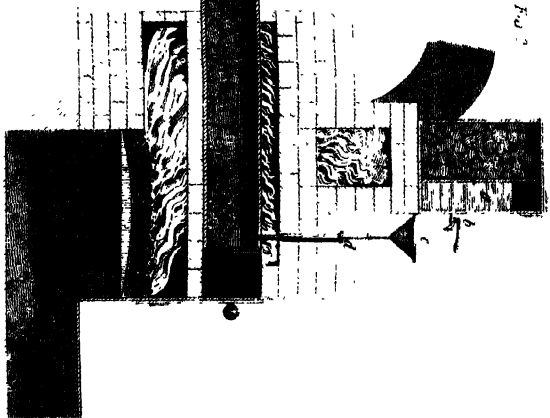
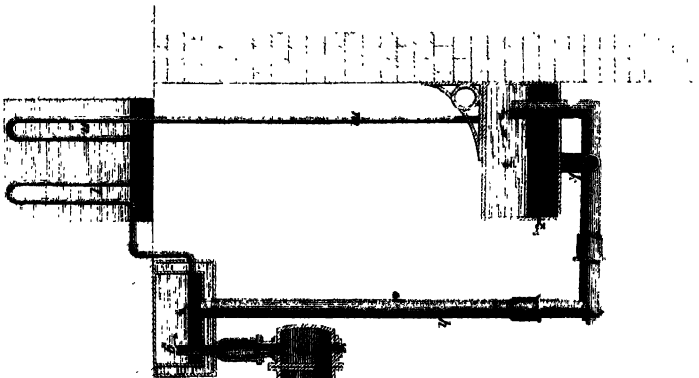
♊ The Waxing Moon.—☾ The Waning Moon.

Rotherhithe.

J. LEWTHWAITE.

ENCKE COMET.—On the evening of the 25th, observed this Comet, in the constellation Pegasus, a little to the West of a Nebulous Star, near the nose of that Constellation.

Charles H. ...



THE

JOURNAL OF ARTS AND SCIENCES.

No. XII.

[SECOND SERIES.]

Original Communications.

**ART. XVIII.—ON THE LAWS RELATIVE TO PATENTS
FOR INVENTIONS.**

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—I regret to trouble you again with communications of my thoughts on Patent Laws, but your Journal of this month has brought new ideas to my mind, which more clearly develope to my view what our present judges conceive to be a proper foundation for Patent right. If my conjecture on this head be correct, then I hope that you will find its explanation worthy of a place in your valuable Journal.

Before I proceed on this point, I must beg leave to say that “Vindicator” mistakes, in thinking that I infer that Patents are granted in the shape of rewards. I am not aware of having stated anything which can lead to such

a conclusion ; but on the contrary, when I stated the transaction of applying for, and obtaining a Patent to take place in the shape of a bargain, where one consideration is given for another, *reward* is out of the question.

But, although I cannot agree with Vindicator upon all the points in question, yet I freely allow that I find much good and sound argument in his statements, and I fully agree with him in the main point, namely, that salutary changes in the Patent Laws are highly necessary.

Now to the point of our present laws ; I see it laid down as law, that the discovery of existing principles is not patentable ; but a method of making principles subservient in a practicable way to certain purposes, if that method be new, the Patent is good. To understand this clearly, a true definition of what is meant by “ principle,” is absolutely necessary. On due reflection, I find that a principle is the immediate cause of the effect brought in question. Thus, by saying that a cask may be moved forward on various principles, namely, on the principle of *rolling* it forward, or on the principle of *pushing*, or *shoving* it forward, or on the principle of *carrying* it forward ; in every case the rolling, shoving, or carrying, are so many different causes, which would produce the effect of bringing the cask forward ; and suppose it not to be generally known that any such cause would produce such said effect, and that a person obtains a Patent for having found it out, such Patent would be bad ; but if the Patent were taken for a new method to produce such cause, in other words, to bring such cause into operation, that Patent would be good.

So may it likewise be said, that a knife may be sharpened by a stone on two principles—either by drawing the knife laterally over the surface of the stone, or holding the knife against the surface of a revolving round stone ; both are causes of the knife getting sharp ; and the discovery of

such causes, were they not known, are not patentable ; but if a Patent be taken out for a method of moving the stone for that purpose, or of passing the knife over a stone, the Patent would be good.

Now, Gentlemen, before I go any further, permit me to ask is it right, is it wise, or is it equitable, that such should be the law ? I will at once prove to you how the discovery of an existing principle, but not yet in practice, may be as useful to the public as the discovery of a method. In so doing, I will have recourse to my own invention.

The best mode of sharpening a knife, is to draw it over the surface of a suitable stone, or emery coated substance, from heel to point, in such lineal direction, as forms an angle of 45 degrees, with the breadth of the knife. By moving a knife laterally, and in contact with a revolving stone, in the usual way, the desired grinding lines are obtained. But an evil exists in this, and other modes of sharpening knives—the edge is always more or less turned, contrary to the grinding side. To obviate this, I have found out, that if two stones are turned in contrary directions, their peripheries slightly touching each other, and the knife drawn at right angles with the stones at about the place where they touch, and being prevented by a fixed rest from being *drawn betwixt* the stones, it will most effectually, and in the best way be sharpened. Now here is a useful principle, but not patentable. Thank goodness, I have not purchased a Patent for it; and if it is worth anything, the public are welcome to it, gratis.

Next, I would ask, whether it is just and equitable, that a poor industrious man, having discovered an unknown useful principle, under the impression that he is quite in order, applies for a Patent to such officers of the Crown, who ought to know that such Patent is not tenable ; and yet, that such officers should not only pocket the poor

man's money, but thereby, perhaps, cause his utter ruin ! I particularly beg not to be misunderstood ; I do not mean to cast the most distant reflection upon the conduct of any officer or judge ; or, indeed, any one in Patent proceedings, but solely on the miserable legal usage of granting Patents, as it now stands.

I further wish to show how ambiguous the meaning, or conception of " principle" and " method" is, and how very difficult, I may say, almost impossible, it is to determine with precision, what is " principle" or " method ;" their meanings are as relative, as those of " cause" and " effect." In all movements, combination of movements, or actions, for some fixed purpose, only one real first cause creates its existence, and that cause is impenetrably hidden from all human conception, understanding, or scrutiny ; but as the movement, which we do see, produces further consequences, we find it convenient to call such movements " causes," and their consequences " effects." In many cases such effects produce further consequences ; then these last mentioned effects turn again into causes, whereof the last mentioned consequences are the effects, and so on.

Let us suppose a train of causes and effects in operation, to produce a fixed ulterior object, the last cause then, which preceded the object produced, and which in its effect, is to all intents and purposes, the principle upon which the object has been produced, and the cause through which the before mentioned cause was produced, must be the method. For instance, let us take the steam engine ; the fire causes steam, the steam causes inequality of pressure, that again causes the beam to move, &c.

Now, may it not be stated thus, " the beam is moved upon the principle of unequal pressure, and the method to produce this unequal pressure is by means of heat, eva-

porating water, and introducing the steam, &c." Likewise "the piston is moved upon the principle of causing as much vacuum over or under it as possible, by introducing steam, &c. &c., and the method of doing so is by boilers, pipes, air pumps, &c." Query—Was Bolton and Watts's Patent grounded on the principle of forming a vacuum, or the method of producing that principle?

Considering further, that "principle" is not patentable, but that "method of application" is, most lamentable consequences present themselves to my view; mechanical methods for the application of principles may be so much varied, that after a Patent shall be obtained for one, a number of other Patents may be had and considered good for the same object, to the great prejudice of the first meritorious inventor, by only varying the method of application*; but, what above all is most striking, is that the greatest and most eminent lawyers of the kingdom find it good that the Patentee puts at the end of his claim in his specification, the following words, namely, "the way in which I do perform, or work my said invention of * * * *", I have clearly set forth and shewn in this, my specification; but I also reserve to myself the right of working the same by any other method or methods, through which the same principle shall be produced," or other words to that effect; and I repeat, that if such right were not reserved, many of the most valuable inventions could absolutely not be made secure to the inventor. What jargon! What contradiction! The more I read, and the more I hear of Patent Laws, the more I find perplexity exemplified! Seeing thus how inadequate the limited faculty of our understanding or reasoning is to the formation of precise and

* See the case stated in our last, as respects shearing machines on a rotatory principle.

intelligible definitions of what shall constitute Patent claims, and infringements, would it not be best to leave the judging of them to such men as may be generally acknowledged less liable to err in their ideas of what is reasonable and right, than to such as had no opportunities of making those matters their chief studies? I allow, that if a better mode could be found out, it were well to reject my suggestion, which is far from being desirable, if not driven to it by necessity; but so long as I shall not see a preferable and practicable way pointed out, I cannot alter my opinion on this head; I also repeat what I mentioned in a former communication, that seeing how very difficult it is for any man to judge whether his claim for a Patent is good or not, he should, on application, be informed of it by proper authorities, without being subjected to heavy losses, and after, perhaps, having laboured for years, and expended a fortune in perfecting an invention, which ultimately is determined by a court of law to be an infringement in principle upon something which has gone before.

I am, Gentlemen,

Your most obedient servant,

M. DE JONGH.

Manchester, Feb. 5, 1829.

ART. XIX.—ON THE LAWS RELATIVE TO PATENTS.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—The earnestness of your correspondents, and the space you have devoted in your valuable work to the discussion of the "*Laws relative to Patents*," is a proof of the increasing interest felt on the subject; and that the cause of scientific reformation is advancing, may be fairly inferred from the numerous points of agreement in the communications of your correspondents.

That the "laws relative to Patents" are anomalous in their character, doubtful in their interpretation, and frequently injurious and oppressive in their application, is a *fact* generally admitted; and that they were founded on views and feelings at variance with the present enlightened state of society, is a truth, too obvious to stand in need of the *argumentum ad hominum*.

At a period of the world, when the "march of intellect," and the expansion of the human faculties are directed to the investigation of facts and principles—when the phenomena of nature and her elementary powers—the "great globe itself"—its ponderous material and various productions, are all laid under contribution by the ingenuity of man, to supply his wants, or to promote his interests—to increase his resources, or to raise his condition: in a state of society, when the inventive powers are sharpened by necessity and excited by competition, when improvements in the arts are available as matters of business, and needful to keep pace with the progress of civilization, is it just and right that absurd laws, founded on corrupt and oppressive principles, should at once be expunged from the national code, and replaced by others more correct in principle, less expensive in operation, more facile in their application, and more efficient in their protection of a highly meritorious and deserving class of individuals, to whom this *great country* is chiefly indebted for its present high rank among nations. It is to our Arkwrights, our Watts, our Peels, and our Bakewells, that we owe the unparalleled extension of our commerce, the increase of our manufactures, and the improvements in agriculture—the inexhaustible resources of our power and prosperity.

It is to impressions and feelings of this character, that we may attribute the approximation in opinion, that ap-

pears to be generally entertained on this subject; and your correspondents are agreed, that an alteration in the "*Laws relative to Patents*" ought to be made, that a *new court* for the *adjudication of the claims of Patentees* has been shewn to be needful, and allowed to be practicable, that the expenses should be greatly reduced by the abolition of official fees, that when a Patent is obtained, the protection of the grant should secure the property from infringement and piracy, so far as just and equal laws are capable of doing, without the necessity of expensive law suits. But it is on the details of this measure, and the powers with which such a court ought to be invested, that your correspondents are at issue.

"Vindicator" appears quite alarmed at the idea of the commissioners having the power to refuse the grant of a Patent on application; and another of your correspondents thinks it highly objectionable, that the "*researches and ingenuity of the whole country* should be under the controul of a few men, whose acquirements and views, from the nature of man, would be limited and partial."

This appears to be anticipating an evil, which there is no just ground to suppose will exist. The reduction of the expense and charges for patents, will assuredly increase the number of applicants, many of them in the lower ranks of life, whose reading and experience may prevent their knowing of the previous existence of a Patent, or the practice of a particular process for which they apply; and as prevention is a preferable remedy, so the wholesome and impartial refusal of the commissioners may save the applicants much vexation, disappointment, and expense. The same circumstances may occur to the best informed persons, and the superior knowledge and information of the commissioners, would be beneficially exerted in protecting their property, by refusing the grant.

Again, in cases of applications for trivial and unimportant objects, the refusal would operate beneficially upon society, by saving expense and litigation. I grant that such a power should be exercised under *due limitations*. The fact of the invention or process not being new, should be *clear and obvious*, and the *reasons* for the *refusal distinctly stated* to the applicant; and an appeal from the decision of the commissioners might be made by affidavit to the Court of King's Bench, who might direct a *mandamus* to compel the commissioners to grant a Patent, should the court see just grounds for so doing. This provision, it appears to me, would meet the objection of your correspondents, and secure for the Patentee the due administration of justice.

A Patent Grant from the Crown appears, to my apprehension, in the light of both a *reward* and a *bargain*; a reward, because the Patentee has the sole privilege for the given period; and a bargain, because His Majesty secures for the public the full and particular description of the discovery, and the law ought to give in return *protection and security*. In this case, there is the *quid pro quo* in the reciprocity of mutual benefits, and the grant should not be made, unless the applicant can give some valuable invention for the exclusive rights received by his Patent.

Your eloquent correspondent, Vindicator, strongly denounces monopolies, and conceives that the grant of Patents under the great seals or otherwise, are the last remains and worst features of that scandalous system that oppressed the nation, under the reign of the Tudors and the Stuarts. He displays an intimate acquaintance with the subject, and is so luxuriant in phrases, so prolific in terms, and so appropriate in designation, that one is almost tempted to think him *one of the initiated*; the "capacious hanaper of Chancery," the "wide gaping bottomless

coffers of the Royal treasury," are topics on which he loves to dilate, and like another Hercules, is ready to apply his powers in cleansing this *Augean Stable*, "the capacious hanaper."

But surely, Vindicator does not intend to question the propriety of a Royal grant, in the shape of a Patent for valuable discoveries; if so, how is genius to be rewarded, and inventions to be fostered and encouraged. Surely he ought to have supplied us with a succedaneum, more favourable to the objects proposed, and given us an account of the law he would submit; perhaps, in a future Number, he will favour us with the details of his plan. But until something better is proposed, I must beg to concur generally with the plan suggested by Mr. De Jongh. It appears sound and practicable, and calculated to answer the end proposed, by giving security and protection to Patent property; and the commissioners appointed under such an act are not more likely to abuse their important trust, than the Commissioners of Bankrupts, or the magistrates of the country; and if an error in judgment should occur, or any deviation from the principles of justice be manifest, the means of correcting such error or mistake should be opened and directed to the parties aggrieved.

In order to give this subject a practical direction, let the suggestion of your correspondent R. be attended to, and a petition be presented to Parliament forthwith, that the House would immediately appoint a committee to inquire into the laws affecting Patents, with power to examine evidence, and report thereon. It is here that the various opinions of correspondents may be collected, and the result, it is presumed, will be beneficial to the country, by arranging and settling a new code of scientific laws, calculated to give protection and encouragement to the extending knowledge of practical arts and useful manufactures.

I ought to apologize for occupying so many of your pages, but would just suggest, in conclusion, that the spirit of improvement is abroad, and the present period appears favourable to the attainment of the object, and that active means should forthwith be adopted to bring the subject before the House of Commons.

I am, Gentlemen,

Your obedient Servant,

J. RAYNER.

King Square, Goswell Road,
Feb. 11, 1829.

ART. XX.—ON THE FEES AND CHARGES UPON PATENTS
FOR INVENTIONS.

“ They deal in lawful mysteries,
And claim state duties and their fees.”—HUD. page 3.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—I believe those who have had the satisfaction of paying the *legion* of fees demanded for *securing* these inventions, and the public generally, are equally uninformed as to the amount, nature, and appropriation of these *prerogative* aids, to the perennial quantum of venison, champagne, livery, and lace, necessary to the accurate discharge of high official duties.

In pursuance of the implied engagement in my first letter, I purpose lifting, with cautious hands, and modest approach, the veil which separates these arcana from the inquisitive eye of *impertinent* curiosity. I know that I am treading upon consecrated ground, but as I have put one foot upon it, the other very naturally follows its mate. “ What are you about there, Sir?” says his employer to John. “ *Nothing*, Sir!” and what are *you* doing,

Thomas?" "Helping John, please your Honour!" Here is the text and summary of the heavy duties performed in the progress of a petition for a "*Patent*," always excepting those of the pedal organs of the indefatigable solicitor, which vibrate with such interminability of action between office and office, as fairly to entitle him to the parliamentary reward for perpetual motion.

I propose a "*dissection*," Gentlemen; be not alarmed, (I do not mean an anatomical dissection, the present terror of all the old women of the kingdom) of the *regular* charges and fees for a Patent; and then, a notice of those which occasionally occur, to conclude with a general average of the annual account, which John, Thomas, *et multis aliis* receive, for the important services they render to the talent of the country.

We will begin with the Secretary of State's Office for the Home Department. Here a petition to the King is to be lodged, drawn in courtly phrase, and with as good grammar and orthography as may be, but without punctuation, as that only serves to make law proceedings too intelligible. This petition prays His Majesty's Royal Letters Patent under the great seal, for some invention, to be hereafter described in the specification.*

The petition, with affidavit of invention, upon payment of £.2:2:6. is referred to the Solicitor or Attorney-General, who of *course* (no obstacle intervening, as an opposing petitioner), recommends to his Majesty, the grant of the Letters Patent. This recommendation sets the machine in motion; it is *vis inertia*, the *primum mobile* of the wheel work. Upon its delivery at the Secretary

* I beg to apprise novices, that according to the present practice, the *title* of the invention, and its *description*, need have as little relation to each other, as the hyperbolic curve has to a right line.

of State's Office, a warrant to the Attorney or Solicitor General is issued, commanding him to prepare a *bill* for the Royal signature to pass the great seal. The amount of fees paid upon delivery on this warrant is £. 7 : 13 : 6. and upon the bill receiving the sign manual, the further sum of £. 7 : 13 : 6.

The total amount of fees paid at the Secretary of State's Office for doing these *sundry* nothings, is £. 17 : 9 : 6. The expenses of his office is paid by the treasury, and therefore the above sum is one of the "*prerogative aids*."

We will now pay a visit to Mr. Attorney or Solicitor General. (The ambulatory Solicitor of the Patent has already paid many before us.) For Mr. Attorney's accommodating report, stating his opinion of the utility of the invention, and recommending the grant of the Letters Patent, a charge of four guineas is made. Guineas are now out of date. I suppose, therefore, Mr. Attorney is contented to bag four sovereigns, lawful coin, and four good shillings, as I never heard of a lawyer losing his fee, excepting the *poor late* Lord Chancellor, who feelingly laments that forty years ago, he *once* took a brief with the *promise* of his fee. The clerks of Mr. Attorney are now employed in drawing and preparing a long verbose tautological BILL, one of the "*nothings*," or worse than nothing, as to its necessity ; an amiably uninteresting profusion of words, for which, including the organized matter, called paper, upon which they exhibit their *classic* arrangement, and unideal periphrase, the *moderate* charge of £. 18 : 19. is made. I beg pardon, *was* made, for about three or four years ago, a kind of explosion took place, which detached three guineas from this impudent extortion, and blew them *in nubibus*. Upon the *legality* of the demand of these and other fees and charges, I shall make some observations at a future opportunity.

The charge now made for this precious document is £.15:16., and a further sum of £.1:1. for engrossing, *i. e.* for swaddling the beautiful babe in clean clothes ; it is then carried, first to the Lord Keeper of the Privy Seal, then to the Secretary of State, who are the bantling's sponsors, and who undertake for it, previously to its christening, *alias* to its receiving the Royal sign manual, that it contains in its body no treason, sedition, privy conspiracy, heresy, schism, or *emancipation clause* ; but on the contrary, that it is a legitimately formed, right-loyal, and right-royal *incubus*. The total charge of Mr. Attorney-General for his *lying-in*, and for caudle, before the birth, is at present, since the explosion, £.21 : 1.

* * * * *

“ *Proceed, we now, (as the parsons say, after taking a little breath, or fumbling their leaves in vain for a passage, which they have written in an unconsecutive position to the last sentence,) “ to the next head of our discourse.”*

We will accompany the perambulating perpetual motion, now charged with Mr. Attorney-General's beautiful production, to the Signet office, a commodious apartment in Somerset House, *not* a Royal residence, although intended as such ; for Royalty prefereth to fix its seat in the Pontine marshes of Pimlico ; and there we deliver the offspring to the custos of its sponsor, my Lord Privy Seal, who (I believe) *makes out a warrant to himself* to pass on the bantling to its other sponsor, for which extraordinary piece of service, £.3:1. is charged ; and an additional fee of £.1:1. is paid, as *gratuity*, (to whom I cannot learn ;) but this being a *privy* affair, I wish courteously to abstain from an appearance of inquisitiveness. An additional fee of 5*s.* is paid to the Office Keeper. In the same building is the proper office of the Privy Seal, wherein a warrant to the

Lord Chancellor, or Lord Keeper of the Great Seal, is prepared to pass the Patent; for this, £.2 16. is charged, and also another gratuity of £.1 1. to whom I forbear inquiring for the above reason, also 10*s.* 6*d.* to the Office Keeper.

The amount of fees, &c. paid at the Signet Office is £.4:7. and at the Privy Seal £.4:2. making together £.8:9. Now peradventure, it happeneth that my Lord Privy Seal sleepeth or journeyeth far away from the city smoke, and in such cases, his deputy must journey after him with the documents, at the expense of the Patentee, to the amount, in some instances, of £.5, which matter we shall notice under the head of *irregular* fees.

Gentlemen visitors and reformists! We are now about to enter the *sanctum sanctorum* of the edifice, to worship in amazement at the shrine of mysteries, to touch and handle that most curious and intricate work of *art*, the palladium of mystification. We will enter with cautious but determined step, the dens of Chancery. Trust to my guidance, Gentlemen, and although there be bags, baskets, boxes, and hanapers, capaciously formed to receive ye all (I mean your money), and *sealers*, to put wax and pitch-plasters upon ye, I hope to bring you safely out of your perilous situation, after a most interesting peep at the machinery, by which the system works. But in order to allow you a little time to clear your optics, I will take a short leave, remaining for the present,

Gentlemen,

Your most obedient servant,

VINDICATOR.

ART. XXI.—ON DANIEL'S PATENT APPARATUS FOR GENERATING GAS FROM ROSIN, AS CONSTRUCTED BY MR. MARTINEAU, FOR THE LONDON INSTITUTION, WHERE IT IS IN CONSTANT USE.

THE employment of gas illumination for domestic purposes, may justly be considered as one of the proudest triumphs of the chemical philosopher. Previous to the introduction of rosin gas, this desideratum could hardly have been considered to have been effected. The sulphureous vapours that were continually exhaled from the partially purified gas, produced by the decomposition of coal, soon caused it to be ejected from the interior of those royal and noble edifices, where it was adopted in the infancy of the process. It is true that this is better managed in the present day, although we seldom find that the public companies supply it pure for any continuance.

The *oil gas*, although costly, was infinitely better calculated for in-door illumination; and Mr. Pepys, of the London Institution, was mainly instrumental in introducing it to the notice of the public, through the medium of that Establishment.

The same distinguished chemist also suggested the use of gas from rosin in the Institution, and Mr. Daniel liberally permitted the Board of Management, gratuitously, to employ an apparatus under his patent, the economy of which, and the excellence of the process, is now satisfactorily ascertained, and we shall presently furnish data for placing this fact in the clearest point of view.

Plate XI, exhibits the retort and its appendages, as erected at the London Institution. The front elevation, Fig. 1, represents an external view of the apparatus; *a*, the iron tank, in which the rosin is melted, with a given

quantity of oil of turpentine, and furnished with two stop cocks *b, b*, for conveying the hot fluid to the funnels *c, c*. These communicate by means of the syphons *d, d*, with the heated retorts in which the gas is generated.

We may now turn to the sectional view, Fig. 2, and the process will be better understood. The retort *e, e*, is seen charged with coke, which is in the first instance raised to a bright red heat, by means of the furnace beneath. The common brown rosin of commerce, which is deposited in the tank *a*, is mixed with essential oil, in the proportions of one hundred pounds of the former, to ten gallons of the latter. A portion of the flame and heated air beneath, serves to preserve this in a fluid state, and a damper passing across the aperture in the chimney, exactly regulates the temperature of the fluid. A wire gauze screen at *f*, reaches to the bottom of the tank, and prevents the solid rosin, or any impurity with which it may be mixed, from choking the stop-cock.

The melted rosin having passed by the funnel *c*, and the syphon *d*, into the retort, falls on the coke, and in its passage through the ignited mass, becomes decomposed. On arriving at the other end of the retort, a large portion of the oil of turpentine in the form of condensable vapour, is separated by the refrigerator *g*; this is supplied with water from a cistern above, and the non-condensable vapour or gas passes up the tube *h*, and dips beneath the surface of the fluid in the vessel *i*. This completes the condensation, and the gas proceeds in a perfectly pure state by the pipe *k*, to the gasometer, or rather to the floating reservoir for use.

The essential oil, when it leaves the refrigerator, is conveyed by the syphon *b*, to a cistern beneath. The necessity for employing a syphon, will be apparent, when it is borne in mind that the tube prevents the escape of the gas,

which would otherwise pass away from the box, with the essential oil. Another syphon and pipe *m*, serve to convey the condensed essential oil from the top cistern.

The burners in the London Institution consume about one thousand cubic feet of gas per day, and this is effected by the destructive distillation of one hundred pounds of rosin, at a cost of about six shillings. The essential oil is not taken into the account, as the same oil is used over and over again for any length of time.

The illuminating power of rosin gas, when compared to that from coal, is as two and a half of the former to one of the latter; and the economy of the process will be apparent, when we recollect that in addition to the vast advantage arising from its great illuminating power, the material itself for the quantity of gas produced, is cheaper than any other substance that can be obtained.

In the process of preparing the gas, the establishment usually employs about four bushels of coals, and two pecks of coke per day; and as the quantity of gas has been found to vary in amount, from materials nearly similar in quality, it may be advisable to furnish, in a tabular view, the result of one week's operation, commencing the first day of the present year.*

Jan.		Rosin.		Oil.		Gas in Feet.
1	..	100	..	10	..	1,000
2	..	100	..	10	..	1,050
3	..	100	..	8	..	1,000
5	..	75	..	8	..	,700
6	..	75	..	8	..	1,000
7	..	75	..	10	..	,900
		<hr/>		<hr/>		<hr/>
		525		54		5,650

* This is especially necessary when we recollect the absurd clamour that has been raised against the use of rosin gas generally; a clamour that has arisen partly from interested motives, and partly from the clumsy attempts to invade the rights of the Patentee, that have been made by unscientific persons.

We follow this account of the actual operation of Mr. Daniel's process at the London Institution, by a report of his inrolled specification, in which his general object and claim of invention, as respects the production of gas by these means, are set out.

Recent Patents.

To JOHN FREDERIC DANIEL, Esq. of Gower Street, Bedford Square, in the County of Middlesex, for his having invented Improvements in the Manufacture of Gas.—
[Sealed Feb. 1, 1827.]

THE Patentee states, that his improvements apply to the process of obtaining gas for illumination from rosin, coal tar, turpentine, alcohol, or any other bituminous, or carbonaceous substance, coal excepted. For this purpose an apparatus is constructed, consisting of a vessel containing the materials from which the gas is to be produced; which materials being rendered fluid, are carried off by a cock into a funnel, and thence through a pipe into a retort.

The retort is charged with coke, or broken bricks, or small pieces of iron, or any other suitable substance, upon which the dissolved rosin, or coal tar, or other spirituous and carbonaceous matters is allowed to fall in drops, or in a small stream. The retort being heated by the fire in the furnace, ~~by~~ which it is surrounded, a destructive distillation of the rosin, tar, or other material, takes place, and the gas, given out by this distillation, passes by a suitable tube into a refrigerator, where part of the tarry, or other gross

matter, thrown off with the gas, becomes condensed, and the more volatile part passes upwards, to be washed in a vessel of water, depositing again its grosser particles, and thence proceeds to the gas-holder, and to the burners.

The Patentee does not claim the apparatus exclusively as his invention, nor confine himself to the particular construction set out and exhibited in his specification, and accompanying drawing; the general arrangement of which is the same as in the apparatus erected at the London Institution, and shown in Plate XI, of which a particular description is given in the preceding article; but he particularly claims the mode of arranging the pipes and vessels for carrying off the gas, and depositing the residuum; and the partition or elevation, at the end of the retort, to prevent the coke, or other carbonaceous matters, from falling down into the tar vessel below.—[*Inrolled August, 1827.*]

To THOMAS MACHELL, of Berners Street, Oxford Street, in the County of Middlesex, Surgeon, for his invention of certain improvements on Apparatus applicable to the burning of Oil, and other inflammable substances. [Sealed 8th December, 1826.]

THE subject of this Patent is a lamp, in which the oil, or other inflammable liquid, is forced to the burner by pneumatic pressure.

Mr. Machell obtained a Patent in 1818, for an “apparatus for applying air for medical purposes, and applicable to the burning of oil in lamps, &c.” in the specification of which he proposes to condense air by means of a small piston in a close vessel containing oil, and by the elastic force of such condensed air, to raise the oil up a shaft or column, to the burner at top of a pedestal lamp for the

table. The construction of this lamp is described in the second vol. of our first series, p. 354, with a plate, under the title of the *Barrington Lamp*.

The lower part of this lamp was a close cylindrical, or square, metallic box, formed like the base of a column, intended to contain the oil, from which rose up an ornamental shaft, and above the capital was the burner. A small forcing pump was inserted into the base or box below, by which a quantity of air might be injected; and this air, as it became condensed, exerted such a mechanical force upon the surface of the oil as caused it to be raised up the centre of the shaft, to the burner.

The difficulty of rendering all the parts of this lamp perfectly sound and air tight, and the impracticability of governing the force of the condensed air, has rendered the Barrington lamp comparatively useless, although many years of assiduous application, and continual experiment, have been devoted by the Patentee to the perfecting of his invention.

The improvements, therefore, which constitute the subjects of the present patent, are contrivances adapted to the original principles of construction, and are designed for the purpose of obviating the inconvenience of leakage, by the introduction of compensating apparatus, which, in the event of extraordinary pressure, from the air being under too great a degree of compression, allow valves to open for the escape of a portion of the air, and also the rising main, by which the oil passes to the burner, to become contracted or partially closed.

In the base of the column, that is, the close vessel containing the oil, a tube is introduced, as in the former lamp, for the piston of the force-pump to work in. Through this tube, by the action of the piston, the air is injected into the close vessel; but in order to prevent too

great a degree of condensation, there is a small valve in the piston, which, when pressed upon by a greater force of condensed air than is required for raising the oil to the burner, immediately opens outwards, and discharges a portion of the air ; so that it is impossible, however long the force-pump may be kept in action, to overcharge the vessel ; an occurrence which very frequently took place in the former lamp, by the carelessness or inexperience of servants, and the effect of which was either to open the joints of the lamp, and allow the oil to run out, or to force the oil through the aperture of the burner at top, sometimes in a jet or fountain, to the injury of the walls, ceiling, and furniture of the room.

As a further preventive against the oil flowing in too copious a stream through the rising main, or column, to the burner, it is proposed to insert into the column, or tube, through which the oil passes, a quantity of cotton yarn, or such other filamentous substance, as shall only allow the oil in rising to pass by percolation. One part of this tube is intercepted by a stop-cock, through the plug of which the yarn passes. If, therefore, the oil flows too freely, the stop-cock is to be partially turned, which compresses the yarn, by bringing its fibres into a close state, impedes the percolation, and prevents the oil from flowing copiously.

In order that the force of the condensed air in the oil vessel should act upon the stop-cock, and produce the compression of the yarn last described simultaneously with any increase of elastic pressure, from expansion of the air by heat or other cause, a float upon the surface of the oil is connected by a rod to the handle of the stop-cock, and which, ascending or descending as the pressure is greater or less upon the oil, partially closes or opens

the stop-cock, and regulates the supply of oil to the burner accordingly.

This float is of cork, or other light substance, and fits tightly into a tube partly immersed in the oil in the close vessel below. It is pressed downwards by a spiral spring, tempered to such strength as will be an exact balance to the required elastic force of the compressed air. A rod passes from the float upwards, and is attached to the lever of the stop-cock; hence, whenever the pressure of the air upon the surface of the oil is too great, the oil is forced up this tube, which raises the float, and the rod, partially closing the cock, compresses the yarn, and impedes the flow of the oil.

The Patentee adapts the principle of this pneumatic apparatus, with its improvements, to different forms and kinds of lamps. There is, however, a want of simplicity in the general construction: indeed, if we were to judge from the very large drawing which accompanies the enrolled specification, and the multitude of figures represented, with a description filling eight skins of parchment, we might say it is extremely complicated.

We have protracted the publication of the report of this invention, under an impression that a more perfect lamp would be produced than any that has been heretofore made upon this principle. In this, however, we are disappointed. Should the Patentee succeed in producing a perfect lamp, worthy of public patronage, we shall take an early opportunity of noticing it, and of explaining its complete construction, with such graphic illustration as may be necessary; but at present we do not consider that the subject merits that attention.—[Enrolled June, 1828.]

To CALEB HITCH, the Younger, of Ware, in the County of Herts, Brick Maker, for his having invented, or found out, an improved Wall for Building Purposes. [Sealed Feb. 21, 1828.]

THE Patentee says, that his improvement “ consists in a wall built of bricks, with hollows or cavities in them, so formed, that the whole may be cemented together in one solid mass, at much less expense than by the ordinary method, and in such manner that much less mortar will be required, and fewer joints created; whereby a bold and uniform bond is produced, and the expense of repairing the wall much reduced.”

The specification then goes on to describe the sort of mould required for forming the brick, of which the said wall is to be built; but on exhibiting the figures of the bricks proposed to be used, the construction of the moulds for forming them will be immediately obvious.

The shapes of the bricks are to be slightly varied, according to the thickness of the wall intended to be erected, that is, whether a nine-inch, or a twelve inch wall, or one of greater substance. Plate XII. Fig. 1, shews the forms of several bricks connected together for the erection of a nine-inch wall, which consists of the bricks *a, a, a*, called bat headers, placed longitudinally, and the bricks *b, b*, called stretchers, placed transversely, with rebates and dovetail ends, locking into corresponding rebates and dovetails in the longitudinal bricks.

In laying these bricks, mortar or cement is used for fixing them at the joints, and for the bedding, &c. After placing a second course upon a bed of mortar, the joints of the bricks blocking or coming upon the solid parts of the lower bricks, and the dowel holes corresponding, a quantity

of cement is poured into the dowel holes, and into the vacant spaces between the bricks, which, when it has become hard, firmly unites the upper and lower course together.

The cement proposed to be used for this purpose, is to be made of "hot stone lime, burnt brick dust, sharp sand, shingle and flint, or clean gravel mixed together; with as small a quantity of water as possible, just sufficient to give a consistency to the whole.

Every two layers of bricks are to be cemented in this way, and the core formed by the composition will confine the whole of the work together, and cause the wall to become one solid mass.

In erecting a wall thicker than nine inches, or any mass of brickwork, as for piers, &c. another disposition and form of bricks is proposed, shewn at Fig. 2. The erection is to be begun at the angle, by placing what is called the angle header; then lay the closer, and then the stretcher, so as to rebate in with the closer, and then the bat header and stretcher, alternately. In laying the second course of bricks of the same kind upon these, the joints are to be blocked, and the dowel holes made to correspond, as before described, into which, and into the interstices between the bricks, the cement is to be poured: and so on, connecting the whole of the work into one solid mass. In making the reveals for windows and doors, bricks, with indentions suited to the purpose, are to be employed.

When there is likely to be a particular stress upon the back of the wall, as in embankments, &c. iron rods may be inserted through the dowel holes, from top to bottom, so as to form an additional bulwark against the back pressure. In this case, the iron rods are first fixed in the plank or apron below, and the bricks are then let down from the top, sliding upon the iron rod.

The manner of making these bricks is nearly the same as that commonly practised by the makers of ordinary bricks, (viz.) a mould is provided of the proper shape, and made to open, for the purpose of delivering the brick, after it is moulded. A brick table of the usual kind is provided, and the usual admixture of clay and other ingredients having been well prepared, is pressed into the mould in the usual way, and a stock with dowells is employed for forming the dowell holes, at equal distances apart. The brick is then dried and baked in the usual way, and worked up into walls in the manner described.

The Patentee says, in conclusion :—" Now whereas, I claim as my invention, a wall, built of such bricks as are hereinbefore described, and in manner aforesaid, for building purposes; and such invention being, to the best of my knowledge and belief, entirely new, &c."—[*Inrolled April, 1828.*]

To JAMES NEVILLE, of New Walk, Shad Thames, in the County of Surrey, Engineer, for his new invented improved Carriage, to be worked or propelled by means of Steam.—[Sealed Jan. 15, 1827.]

THE subjects of this Patent are, first, a peculiar mode of constructing the running wheels of steam carriages, or rather adapting certain appendages to the peripheries of the wheels of steam carriages, by which they shall be enabled to take firm hold of the ground, and not be subject to slide round, without moving the carriage forward; secondly, in adapting different kinds of gear, by which the power of the engine, as applied to propel the carriage, may be occasionally increased, as in ascending hills.

The running wheels are proposed to be made of iron; and a particular feature in their construction is, that the

spokes are, each of them formed by double rods, their ends inserted into the iron naves being placed nearly together, and the rods extending outwards, at an angle from each other, so as to stand at as great a distance apart, where they are inserted into the iron fellys, as the breadth of the wheel will allow. This is designed to give strength to the wheel.

The periphery, or tire of the wheel, is studded with many small pins, extending out about half an inch, for the purpose of taking hold of the ground, and preventing the wheel, when impelled by the engine, from slipping round upon the surface of the road.

Another contrivance for enabling the wheel to take fast hold of the ground is, by attaching to the periphery or tire, a number of pieces of thin plate steel, which pieces are to be fastened at one end to the wheel, and stand round it in the positions of so many tangents. As the wheel revolves in a forward direction, these pieces being pliant, will roll up to the circular figure of the wheel; that is, accommodate themselves to the circular form of the tire of the wheel, and successively lay close to it, as they come into contact with the ground, and as soon as they have respectively passed, or risen from the ground, will again assume their tangent positions. If, as the wheel is impelled, it has any tendency to slip round upon the surface of the road, instead of rolling forward, these tangent pieces will, as they come successively to the ground, increase the friction, by extending the surface in contact.

The impelling power is proposed to be obtained by a steam engine, connected to the carriage. Any construction of steam engine may be adopted, but one acting upon the high pressure principle is to be preferred.

The working cylinders are to be suspended from the carriage by pivots, so as to vibrate and accommodate

themselves to the positions of the piston rods, which, being attached immediately to the cranks of the main axle, will necessarily vibrate in an angle equal to the throw of the crank. By this means, a vibrating beam is dispensed with.

The Patentee proposes to employ a boiler with pipes, constructed upon the principles set forth in the specification of a Patent granted to him in March, 1826, (see the First Series of our Journal, Vol. XIV. page 294,) and also to employ bellows, or a blowing machine, to promote the combustion of the fuel, and thereby increase the quantity of steam generated. This part of the apparatus, the Patentee recommends to be constructed upon the plan set forth in the specification of another Patent, granted to him in January, 1823, (see the First Series of our Journal, Vol. VIII. page 236.)

The other feature of novelty proposed under this Patent is, a contrivance for exerting variable powers, as occasion shall require, to propel the carriage up hill.

The impelling power is to be applied to the hinder pair of running wheels, which slide loosely upon the ends of the main rotatory shaft, and they are to be connected to the shaft by clutch boxes, which are thrown in and out of gear by a lever, by the hands, either of the director, in front of the carriage, or by the stoker behind, as occasion shall require.

The clutch boxes communicate the ordinary power of the engine upon level ground; but in going up hill, they are thrown out of gear, and the force for impelling is applied to the running wheels through pinions and toothed wheels, which exert an increased power, at the expense of speed.
[Inrolled July, 1827.]

To WILLIAM DAY, of the Strand, in the County of Middlesex, Trunk and Camp Equipage Maker, for his invention of certain improvements on Bedsteads, which improvements are also applicable to other purposes. [Sealed 31st August, 1826.]

THIS invention consists in causing the various parts of bedsteads to expand or contract, by forming the side-rails, posts, and top-rails, or tester, of rods or tubes, sliding one within the other. The Patentee says, "I claim as my invention any and every way in which the same may be effected;" but merely for the purpose, he says, of illustrating some method of enabling the rods to expand, he exhibits in his drawing a mode; which is, by causing one part of the rail or rod, to screw within a tube.

THIS or any other contrivance for expanding or contracting rods or tubes, like the draws of a telescope, may be applied to the rails of bedsteads, which, having suitable stops, may be drawn out and fixed to any desired extent, making the dimensions of the bedstead suitable for one or two persons, the sacking, of course, being let out accordingly.

It appears that the Patentee designs this contrivance principally for camp bedsteads; he, however, also applies the same expanding rods to the backs of chairs, passing them into the hinder legs, and by these means renders both bedsteads and chairs portable, for the purpose of travelling, as parts of camp equipage, or any other purpose to which the same may be found applicable.—[Inrolled Feb. 1827.]

To TIMOTHY BURSTALL, of Leith, Scotland, and JOHN HILL, of Bath, Engineers, for their invention of certain improvements in the Machinery for propelling Locomotive Carriages. [Sealed 22d Aug. 1826.]

THE subjects claimed under this Patent are intended to be associated with other inventions described under a previous Patent, granted to the same parties in February, 1824, for the construction of a locomotive engine or steam carriage. (See Vol. XII. of our first series, p. 294, and subsequent notices of the progress of the invention, in our XIIIth and XIVth Vols.)

We have delayed our report of the specification of the present Patent, in the hope that we should shortly be able to lay before our readers a description of a complete carriage in working order. That hope has not yet been realized, and we give the following account of the improvements claimed under this Patent, with a pledge, that when this steam carriage is in a condition for public service, we shall resume the subject, and give a perfect description of its construction.

The carriage supporting the steam apparatus and other machinery, by which it was to be propelled, and also the body of the vehicle, originally ran upon four wheels; one feature of the present Patent is, the adaptation of an additional pair of wheels to support the boiler on a distinct carriage, attached to the hinder part of that on which the body of the vehicle is conveyed. The object of this is stated to be, to keep the boiler and furnace further from the passengers. The mode of attaching the hinder carriage, allows its wheels, when the carriage is turning or running in a curved track, to accommodate themselves to the winding course; and the pipes, which convey the

water and the steam, are furnished with universal joints, at the parts where they are connected, instead of the elastic connecting pipe, described in the former Patent. This forms the second feature of the present invention.

The adaptation of such gear as shall allow an increased power to be occasionally applied, as in ascending hills, forms a third claim; and steering the front wheels, by means of a spur wheel, and an endless chain, instead of a wheel and pinion, as before, constitutes the fourth claim.

A representation of the carriage, with these improvements appended, is exhibited in Vol. XIV. p. 375, of our Journal; but as we have said above, a complete description of its construction will be given as soon as we have notice of the carriage running publicly.—[*Inrolled Feb. 1827.*]

To FREDERIC ANDREWS, of Stamford Rivers, in the County of Essex, Gentleman, for his invention of certain improvements in the construction of Carriages, and in the Engines or Machinery to propel the same, to be operated upon by Steam, or other suitable power; which Engines or Machinery are also applicable to other purposes.—
[Sealed December 20, 1826.]

THESE improvements apply to locomotive steam carriages, and consist of the following particulars:—First, in placing the boiler or steam generator in the lowest part of the carriage, between the running wheels, and passing the axle of the wheels (which is the crank shaft of the engine) through the boiler; secondly, mounting the working cylinders of the engine upon pivots, and placing them horizontally under the carriage, the ends of the piston rods being immediately connected to the cranks on the axle of the running wheels; thirdly, constructing the fire place of

the boiler with tubes on the sides, communicating with the interior of the boiler, and mounting it and the boiler and engine upon a frame with springs, for the purpose of preventing any inconvenience, which might otherwise arise to the engine from jolting, as the carriage travels upon ordinary roads; and lastly, employing a single wheel for steering, and connecting it, by means of a frame, to the front axle tree of the carriage, and loading it with a box above, for the conveyance of luggage, without adding to the weight of the carriage.

Plate XII. Fig. 3, exhibits a section of the boiler, with the axle of the running wheels passing through, and below is the fire place. The boiler *a, a*, is cylindrical, and has a flue *b*, extending longitudinally through it from end to end. This flue of course communicates with the fire at one extremity, and with the chimney at the other; *c*, is the fire place, attached to the under side of the boiler, and these are together suspended from the frame of the carriage *d, d*, by rods or braces; the frame resting upon springs, as carriages commonly do.

A tube *e, e*, is made through the boiler, for the purpose of receiving the axle *f, f*, of the running wheels *g, g*. This tube is narrow, having no occasion to be much wider than the diameter of the axle, but it is made deep, in order to allow the crank to be passed through, and to afford room for the action of the carriage upon the springs.

The working cylinders are placed horizontally as above said, and the ends of their piston rods are connected to the cranks of the shaft or axle *f*. The centres of the cylinders are on a line with the centres of each crank, and they vibrate upon pivots, in order to accommodate the direction of the piston rods to the throw of the crank. Thus, by the action of the cylinders, the axle *f*, is made to revolve, and the wheels *g, g*, being fixed to the ends of

the axle, are necessarily turned also, which moves the carriage forward.

The sides of the fire place are formed by horizontal tubes *h, h*, filled with water ; the ends of these tubes communicating with perpendicular tubes, which lead into the boiler. Thus the heat, which would be thrown off by radiation, is taken up by the water in the tubes, and steam is thereby generated.

The steering-wheel is a small wheel running in front of the carriage, and is connected thereto by parallel rails, in which its axle turns. These rails are affixed to the fore axle-tree, which locks in the usual way ; and the steering wheel being turned by a lever, causes the fore axle-tree to move round, and to direct the wheels in the course in which the carriage is intended to run. There is to be a box above the steering wheel, to contain luggage or any other weighty article, to keep it firmly upon the ground.

The particular claims of the Patentee are those above enumerated, viz. passing the axle through the boiler—placing the engines as described—forming the sides of the fire place with tubes, and connecting the steering wheel with a weighted box to the front axle tree of the carriage.

As to the form of the body of the vehicle which may be thus propelled, the Patentee does not profess to have invented any improvement. It may be in construction and shape, both within and without, according to any plan that may be found most convenient or desirable.—[*Inrolled June, 1827,*]

To WILLIAM MASON, of Castle Street East, Oxford Street, in the City of Westminster, and County of Middlesex, Patent Axle-tree Maker, for his invention of certain improvements in the construction of those Axle-trees and Boxes for Carriages, which are usually termed or known by the name of Mail Axle-trees and Boxes.—[Sealed Jan. 15, 1827.]

THE design of this invention is to give any required pressure to the ends of what are called mail axle-trees, in order to prevent their shaking in the boxes of the wheels. This object is effected by the introduction of leather collars, in certain parts of the box, and by a contrivance, in which the outer cap is screwed up, so as to bear against the end of the axle-tree, with any degree of tightness, and is held in that situation, without the possibility of turning round, or allowing the axle-tree to become loose.

Plate XII. Fig. 4, shews the section of the box of a wheel, with the end of the axle-tree secured in it. The general form of the box and of the axle is the same as other mail axles, there being recesses in the box for the reception of oil. At the end of the axle, a cap *a*, is inserted, with a leather collar inclosed in it, bearing against the end of the axle: which cap, when screwed up sufficiently tight, is held in that situation by a pin or screw passed through the cap *a*, into the end of the iron box; a representation of this end of the iron box being shown at Fig. 5.

In the cap *a*, there is also a groove for conducting the oil to the interior of the box, with a screw at the opening, to prevent it running out, as the wheel goes round.

The particular claims of improvement, are the leather collar against the end of the axle; the pin going through

one of the holes in the end of the box, to fix it; and the channel for conducting the oil.—[*Inrolled March, 1827.*]

To HENRY ASPREY STOTHART, of the City of Bath, Founder, for his invention of certain improvements or additions to Ploughs.—[Sealed 4th April, 1827.]

THE several features of novelty proposed under this Patent are, first, a mode of varying the points of draught of a plough, to suit either a tall or a short horse; which is, by employing a chain with swivels, and causing the staple, or piece to which the traces of the horse are made fast, to slide upon perpendicular guide-rolls, mounted on the carriage to which the guide-wheels are attached; secondly, in a method of raising or lowering the lesser or land wheel of the carriage, in order to accommodate it to the depth of the larger wheel, which runs in the furrow; thirdly, attaching the ends of the beam to the carriage, by means of a ball and socket, for the purpose of enabling the plough to turn at the ends of the furrows, and which is capable of being raised or lowered upon a screw, in order to regulate the depth of the ploughing; and lastly, perforating the breast or mould-board with holes, in order to admit air, and prevent that friction which is caused by the wet earth sticking to it, as the plough turned over the earth from the furrow.

All the parts of the plough are to be made of iron, except the beam and handles. Plate XII, fig. 8, is a side view of a plough, with the improvements adapted thereto; *a, a*, is the chain by which the plough is to be drawn, having links and joints in several parts, to accommodate it to the draught when that shall deviate from a straight direction; *b*, is the staple or piece to which the traces of the horse

are to be attached; this slides up and down upon two vertical rods, *c, c*, (best seen in the front view of the carriage, fig. 9,) in order to accommodate the draft to the height of the horse, and thereby enable him to exert his power with the best effect against the collar.

The same, Fig. 9, also shows the manner of raising or lowering the land wheel, *d*. The pivot or axle on which this wheel turns, slides in a groove in the upright piece *e*, and the winch *f*, at top, being turned, raises or lowers the axle of this wheel, for the purpose of adjusting it to the height of the ground, or rather to the depth of the furrow in which the other wheel *g*, is running.

The end of the beam of the plough is inserted into a ball and socket *h*, which, being a universal joint, allows the carriage to turn at any angle, in making the bouts at the ends of the furrows; and this ball and socket may be raised or lowered upon the perpendicular pin which passes through it, by turning the screw-box *i*, by its handles. In this way the end of the beam is raised or lowered, according to the depth to which the ploughshare is required to enter the ground.

The last feature of novelty proposed is, the perforated breast or mould-board *k*, which may be pierced, in the manner shown, with holes of any form or dimensions, the object of which is, to allow the air to pass through the mould-board, and thereby prevent it from sticking to the wet earth with such a degree of tenacity as frequently, in the ordinary ploughs, greatly impedes the work, by rendering it more laborious by the adhesion.

The Patentee does not confine himself to the precise mode set out in the figures, of effecting the above object, but claims any other arrangement by which a similar effect may be produced upon the same principle.—[*Inrolled October, 1827.*]

To WILLIAM BENECKE, of Deptford, in the County of Kent, Gentleman, in consequence of a communication made to him by M. William Pescatore, a foreigner residing at Luxemburgh, in the Kingdom of the Netherlands, (on whose behalf this Patent is taken) for an invention of a machine for grinding or crushing seeds, and other oleaginous substances, for the purpose of extracting oil therefrom.—[Sealed February 20, 1827.]

THE principle feature of this invention is, the peculiar form and position of the internal parts of the oil mill, which the Patentee considers to be perfectly new, as applied to that purpose. It consists of a conical recess, having teeth or grooves cut in it, and of a frustrum of a cone, with corresponding teeth upon it, working in the recess, in a perpendicular position.

This contrivance is represented in Plate XII. at Figs. 6 and 7 ; *a, a*, Fig. 6, is the fixed part of the mill, shown in section ; *b*, the conical recess, with teeth or grooves. Fig. 7, represents the frustrum of a cone *c*, with teeth or grooves formed upon it, which is intended to work in the recess.

The frustrum is mounted upon an axle *d*, which passes through a central aperture at *e*, in the fixed plate, and the ends of the shaft are supported in plumber boxes, set upon rails in a wooden frame, which may be easily conceived, although not shewn in the figure.

It is necessary, that the two conical parts should be set very accurately that is perfectly concentric, and a screw is inserted at *f*, for the purpose of adjustment, by which the two surfaces of the grinding parts may be brought nearer together, or set farther apart.

When these parts are properly mounted in their frame, the seed, intended to be crushed, is introduced by a

hopper, and conducted down the channel *g, g*, into the mill. Rotatory motion being now given to the frustrum *c*, the seeds become crushed as they descend, and the oil expressed runs out at the aperture *e*, and is received in a suitable vessel below: while the meal and husk of the seed falls out of the mill on the reverse side at *h*, and by the operation of grinding has become so warm, that it requires no more heat, previously to being pressed into oil cakes.—[Inrolled August, 1827.]

To HUGH EVANS, of Great Surrey Street, in the County of Surrey, Lieutenant in Our Royal Marine Corps, and WILLIAM ROBERT HALL KING, of Snow Hill, in the City of London, Tin-plate Worker, for their Invention of a new Table Apparatus, to promote the ease, comfort, and economy of Persons at Sea, or on Nautical Excursions.—[Scaled 12 June, 1827.]

THE subject of this invention is an apparatus designed to be attached to a table on ship-board, for holding dishes, plates, bottles, glasses, and other articles, in order to prevent their falling off, as the ship rolls and pitches in rough weather.

The apparatus consists of a ring of metal, sufficiently large to receive a dish or bowl, from which a piece of metal extends, having a screw and clamp, for the purpose of making the ring fast to the table. To this ring is attached, by hinge joints, various other rings, and spring holders, which, when opened outwards, serve to receive plates, bottles, drinking-glasses, cups, knives, forks, spoons, &c.

The Patentees do not limit themselves to any particular number of holders which shall be attached to the central ring, nor to any particular shapes, as their invention con-

sists in the contrivance of an apparatus for holding these sort of articles on a ship's table in stormy weather, by rings and spring catches, and which apparatus, when not required to be used, may be unscrewed from the table, and all the holders folded back upon their hinges, and enclosed within the central ring, and the apparatus stowed away in a small compass.—[*Inrolled Dec. 1827.*]

To JOHN WERE CLARK, of Tiverton, in the County of Devon, for his Invention of an improved mode of attaching, fixing, or securing the dead eyes to the channels and sides of ships or vessels.* [Sealed 8th June, 1827.]

THE Patentee states, that great inconvenience arises from the ordinary mode of attaching to ships of war the dead eyes, by which the masts and rigging are braced.

Plate XII, fig. 10, shows a section of part of the side of a ship, with the dead eyes attached, upon the improved plan. The same figure also illustrates by dots the objectionable manner of fixing them, as heretofore practised. *a*, is the pulley block, constituting one of the dead eyes; *b*, is the channel by which it is kept out from the side of the ship; and *c*, is the chain, shown by dots, fastened to the side of the vessel below, by which the dead eyes are usually held.

When a vessel is in action, these chains frequently prevent the guns at the lower port-holes from being pointed obliquely, and therefore it would be very desirable to remove them, which is done in the plan proposed, and another mode of fastening adopted. A still more important objection, however, exists to the mode of fastening by the chains, shown by dots, which is, that in the event of the mast being carried overboard by a shot, or in a storm, it has been found extremely difficult to disengage

the dead eyes and the chains from the vessel, and the mast and rigging have been frequently held in a dangerous situation, hanging over the side of the vessel, without the power of releasing them.

Instead of the bracing chain *c*, the Patentee proposes to form the channels *b*, by a series of strong iron brackets, *d*, each having a hook at the end, over which the staples of the dead eyes are passed, and are thereby held with sufficient tension. All obstructions to the guns of the lower port-holes are thus removed, and in case the mast should be carried overboard in a storm, or in action, the staples of the dead eyes immediately fall from the hooks under the channels, and the mast and rigging becomes released.

The channels may be covered with grating, or planked, if necessary, and rails may be attached to them to give strength, should that be required.—[*Inrolled Dec. 1827.*]

TO GEORGE ANTHONY SHARPE, ESQ. of Putney, in the County of Surrey, for his invention of an improved Table Urn.—[Sealed July 18, 1827.]

THE intention of this improved table urn, is to supply boiling water from one part of it, and at the same time, furnish tea or coffee from another part. A section of the apparatus is shewn in Plate XII. Fig. 11; *a*, is the urn, containing the water, which, while standing on the table, is kept boiling, by means of a heater *b*, in the ordinary way. Under the heater, there is a strainer *c*, through which the water passes to two pipes. The pipe *d*, conducts the boiling water down to the cock *f*, where it may be drawn off for the ordinary purposes of the table; the pipe *e*, conducts the water through a stop cock *g*, into the vessel *h*.

The vessel *h*, is designed to contain tea or coffee, which is introduced into it through an aperture, to be covered by a lid, in a similar way to other tea or coffee pots, when in use. The boiling water for making tea or coffee is, as occasion may require, taken from the urn *a*, above, through the pipe *e*, and stop-cock *g*, by moving the handle *j*; and when the tea or coffee is to be drawn off into cups for use, it passes from the vessel *h*, through a grating at bottom, and thence by the pipe *i*, to the cock *f*.

In order to hide the horizontal slit, in which the handle *j*, is moved, a collar of metal, rendered ornamental on the outside, may be made to embrace the cylindrical part of the urn, where the stop-cock is placed, and to slide round, as the handle is turned.

The external form of the urn may be varied at pleasure, according to taste or fashion, without deviating from the improved principle of construction, which consists in the combination of the water vessel, with that in which the tea or coffee is made; and the mode of communication through the stop-cock; and also in the contrivance of the two pipes in the barrel of the discharge cock: the one delivering water, the other tea or coffee.—[*Inrolled January, 1828.*]

To JOHN HAWKS, of Weymouth Street, Portland Place, in the County of Middlesex, Iron Manufacturer, for his having found out or invented an improvement in the construction of Ships' Cable and Hawser Chains.—[Sealed 10th July, 1828.]

EXPERIENCE has taught, that the ends of the links of chains wear out by the friction much sooner than the sides of the links; the Patentee has, therefore, proposed to construct chains for nautical use, with links which are considerably stouter at the ends, than in the middle.

In order to accomplish this, he forms the bars or rods of iron, from which the links are to be cut, with swells or protuberances, in the manner shewn in Plate XII. Fig. 12. These are then cut into lengths, and being bent up into the elliptical form, shewn at Fig. 13, the ends are welded together, and the link finished.

The rods may be thus formed by rolling, swagging, or any other means; and when the link is welded together, it may be strengthened, by having a brace or stretcher placed across the middle, as chain cables commonly have. [*Inrolled September, 1828.*]

Nobel Inventions.

A NEW constructed apparatus for raising water, the invention of a gentleman named Bernhard, and for which he has lately obtained a Patent, is much spoken of as developing a new feature in the sciences of pneumatics and hydraulics. We have not yet been able to see the apparatus or the models, but are informed by a scientific gentleman, of considerable repute, that there is much promise in the plan, as far as he has been able to investigate it. We quote the words of a letter, in reply to our inquiries on this subject:—

“ The invention of Mr. Bernhard seems to open a new field for experiment, and if his positions be correct, is likely to be of the highest importance to hydraulics generally, and in a conspicuous degree applicable to the purpose of raising water, either for the supply of water to houses in populous towns, for drawing mines, bogs, &c. while its application as a general power, must add greatly to its value.

“ The distinguishing features of this invention are, its great simplicity of construction, its safety, and its durability; all of which are of first-rate moment in machinery of every kind. Another peculiar and important feature in the invention, as regards its application to supplying water to houses is, that the water becomes in a degree purified in its passage, by the nature of the apparatus itself.

“ It still remains to be proved whether by this discovery of generating power, by means of the circulation of water or quicksilver, a degree of power will be produced by a consumption of fuel equal to what would be required to produce the same quantity of power in a common steam engine. If the inventor has satisfactorily proved this fact by experiment, then he may with justice claim to himself the palm for the superiority of his discovery.”

The practicability of raising fluids to any height, by the above method, which appears to admit theoretically of no doubt, has also been demonstrated, as we understand, by several experiments, which the inventor has made with a model for raising quicksilver; when the fluid was raised 70 inches high. A water work for raising water, on the same principle, to the height of 70 feet, is now constructing in the neighbourhood of the metropolis, and, as we understand, is on the eve of being finished.

We hope, therefore, in our next to be enabled to lay before our readers some facts relating to this discovery, which appears to be as interesting to science as it is important to the practical purposes of life; and we shall also endeavour to obtain from the inventor himself some details of the first cost, general economy, and available power of his machinery.

Wind Harmonica.

A curious musical instrument, under this title, is now generally sold about the streets of the metropolis. It is very simple in its construction, and consists of a series of metallic bars, put in motion by air. The production of musical sounds by the vibration of springs is not a novel invention : the idea is to be found in that very curious old work, the *Musurgia* of Athanasius Kircher, published at Rome in 1650 ; but it is only at a very late period that the idea has been reduced to practice. The first instance of it occurred at the beginning of this century, when, by the skilful application of metallic springs for the reed-pipes, Mr. Flight effected a material change in the construction of organs ; and through these means have the instruments constructed by Messrs. Flight and Robson attained their singular perfection. This improvement was generally adopted. The principle was then applied on a much smaller scale ; and the diminutive instrument, called *the Mouth Harmonica*, was invented in Germany. Pieces of metal, varying in size from a shilling to a crown-piece, are pierced with longitudinal apertures, varying in size and number, suited to the chords and loudness of the tone to be produced by the vibration of the springs, with which they are partially closed. To some a mouth-piece is adapted, others are simply applied to the lips. Some, designed as substitutes for a tuning fork, produce only a single note ; others only a single chord ; in many, two or more chords are combined, and the effect is then enchanting, resembling what we should conceive of a Lilliputian band of martial music, or a fine-toned organ at a distance. For the production of melody, two or more of these small instruments are required, which are harmonized accordingly. A keyed instrument, designed to accompany the piano-forte, has been exhibited in this country ; the effect

was pleasing: for the purpose it was designed it was well adapted; but when played by itself, the ear was altogether disappointed. An organ constructed solely with springs would not be tolerable,—a judicious combination of them with reed and other pipes, is necessary to impart the full richness of tone, which occasions the superiority of that grandest of instruments.

Paper Linen.

A new invention, called *papier-linge*, has lately attracted much notice in Paris. It consists of a paper made to resemble damask and other linen so closely, that it is impossible, without a close examination, to detect the difference; and even to the touch, the articles made from the *papier-linge* are very much like linen. They are used for every purpose to which linen is applicable, with the exception, of course, of those in which strength and durability are required. A French paper, indeed, says that they are almost as solid as those manufactured from linen; but this cannot be possible. The price is very low; a napkin costs only five or six centimes, about a halfpenny, and when they are dirty they are taken back at half price. A good-sized table-cloth sells for only a franc; and for the same price we may have a rouleau of paper, with one or two colours, for papering rooms, or for bed-certains.

Colouring Liquors.

Indigo, dissolved in sulphuric acid, affords a permanent blue colour. Take indigo in powder, and grind it up with a small quantity of water, in a glass mortar; on this pour, from time to time, a little concentrated sulphuric acid, at 66°, or until the indigo appears to be entirely dissolved. Then add to the solution carbonate of lime in

powder, which neutralizes the sulphuric acid, forming with it sulphate of lime, which becomes charged with the blue colouring matter of indigo. After filtering it, and mixing it with the yellow of carthamus, we obtain all the varieties of green which can possibly be desired. This preparation in small quantities is not injurious to the health, nor does it change the flavour of the liquors which are coloured by it. The confectioners use it also to tinge the green sweatmeats with.

Polytechnic and Scientific Intelligence.

SOCIETY OF ARTS.

THERE have been but few mechanical subjects possessing any particular merit submitted to the approval of the Society of Arts, since the commencement of its present session: but a novel feature has sprung up in the society, which appears to have excited considerable attention. Their learned and scientific secretary, Mr. Arthur Aikin, has commenced a course of lectures on different branches of manufacture, which are delivered before the members and their friends every alternate Tuesday evening.

A variety of works of art, such as the members and friends of the society may occasionally think proper to lend for the occasion, are displayed in the rooms; and, after the lecture is concluded, the company occupy themselves in conversation, and are refreshed with tea and coffee.

The subjects of the two first lectures, which took place on the 27th of January and the 10th of February, were the manufacture of ancient and modern pottery and porcelain.

The lecturer commenced, by describing the constituent parts of different kinds of clay, the chemical and plastic properties, and the reasons for their becoming hard, when submitted to the

action of fire. Clay is composed, for the most part, of aluminous and silicious earths, which, when mixed with other matters, and acted upon by fire, produce different kinds of earthenware and pottery; the colour depending upon the qualities of the earth, and its hardness upon the intensity of the heat, which brings it into a state, more or less, approaching to glass.

The most ordinary kind of pottery is common bricks and tiles, and the use of these existed as early as the building of Babel. Specimens of some of the bricks taken from the ruins of ancient Babylon, where produced from the Museum of the East India Company. Bricks were known in ancient Egypt; the Pyramids are built of them. In that country, the clay was mixed with chopped straw, and they were sun dried, instead of being burnt. The Grecians erected buildings of bricks; the Romans did the same, mixed with stones.

The ancient and modern modes of making bricks were described—a practice of no great antiquity among the English. By the common process of hand labour, one man has been known to mould 11,000 in a day: the average quantity, however, is not more than 5,000; but this, according to the Lecturer's opinion, shews that manufacturing bricks by machinery could never be attended with profit. It is a matter, perhaps, not generally known, that vast quantities of brick are exported from England to different parts of the world. The modern City of Moscow has, in a great measure, been built with English bricks.

The lathe or potter's wheel for producing round earthen vessels, is an invention of great antiquity; Isaiah and Homer, both mention it.

The Deptford clay is used for common red pottery ware, and in order to produce glaze, it is washed before burning, with a cream made from lead ore, and is cooled gradually to prevent cracking. This glaze is dissolved by sharp vegetable acid, and extracts of fruits have, by remaining in glazed vessels, become poisonous.

LONDON INSTITUTION.

The evening parties for the exhibition of new and curious articles in arts and manufactures, commence on the 8th of March.

Fishes.

It is the opinion of two celebrated French ichthyologists, M. M. Bloch and Lacépède, that the mackarel and some of the gregarious fishes do not, as is commonly believed, migrate from their respective seas, but merely quit the vicinity of the shores at the approach of winter, and lie among the mud at the bottom of deep water, till revived by the warmth of the ensuing spring.

Vital Parts of a Tree.

The innermost layers of the bark, and the outermost layers of the wood, are the most vital parts of the stem of a tree, and those on the healthy condition of which the whole plant most immediately depends. Hence, many trees continue to exist for years, when the central part is completely decayed, or even not present; so that the trunk is a hollow cylinder, sometimes of most spacious dimensions.

Standard Measure of Length.

The longer a pendulum is, the lower are its vibrations, and *vice versa*; consequently, if a pendulum be required to vibrate seconds, it must have a determinate length. This length, in the latitude of London, has been found by Captain Kater, to be 39.1393 inches of the new imperial measure.

Thaws.

The disappearance of frost, and the melting of the snows, accompanied with rain, are intended by nature to

loosen the soil for the expansion of the roots of plants, and at the same time to supply the fluids, which are to form the sap. Where chalk, limestone, or marble abounds either in rocky masses, or diffused through the soil, in the form of sand or gravel, the thaws of this season tend to disintegrate the more compact portions, and set free their carbonic acid, which being washed down to the roots of plants by rain, constitutes an important portion of their nutriment; or at least, serves as a stimulant to excite the orifices of the fibrillage, to imbibe nutritive juices.

American Patents.

[The List of Patents granted in March, has not arrived.]

(Continued from Vol. 1, page 170.)

In the mode of sawing shingles, called the "Gauge Saw Shingle Machine," Cheney Read, of Western, Worcester County, Massachusetts, April 2.

In constructing bellows or blowing machines, Elijah Brady, Mount Pleasant, Westchester County, New York, April 3.

In the manufacture of cooper's work, Hiram Waters, Watertown, Jefferson County, New York, April 3.

In an oven for baking over a cooking furnace, Eli Moody, Northfield, Franklin County, Massachusetts, April 5.

In a safety compass lamp, Joseph Feinour and Joseph Feinour, jun., Philadelphia, April 5.

In making terro metallic teeth, Anthony Planton, Philadelphia, April 5.

In the machine for carding wool, Henry A. Shannon, Columbia County, New York, April 5.

In raising water by vacuum, produced by steam, together with an improvement in mill gearing, Joseph S. Fox, Otto, Cattaraugus County, New York, April 5.

In the art of distilling by steam, Benjamin Barr, Strasburg Township, Lancaster County, Pennsylvania, April 5.

In the machine for shearing cloth, Isaac Kellog and George C. Kellog, New Hartford, Litchfield County, Con. April 7.

In the mode of transporting carriages, &c., on the inclined planes of railways, Moncure Robinsou, Henrico County, Virginia, April 9.

In the thrashing machine, John H. Bennet, of Aurelius, Cayuga County, New York, April 10.

In the fire engine, Ezekiel Daboll, Canaan, Litchfield County, Conn., April 10.

In locking hind wheels of waggons, &c. called "the Franklin lock," George Diven, of Franklin County, Pennsylvania, April 14.

In the mode of obtaining water, Timothy Davis, Lawrence Township, Dearbourn County, Indiana, April 14.

In the mode of manufacturing paper from a marine production, or sea grass, or weed, designated by botanists as "*ulva marina*," Hayden Collier, Plymouth County, Massachusetts, now in London, England. April 15.

In the mode of making sugar boxes by machinery, Paul Pearson and John Howe, Alma, Lincoln County, Maine, April 15.

In medicine, Fitzgerald Bird, Hancock, Georgia, April 16.

In the machine called Brown's reel for tanning or handling hides, skins, &c., William Brown, Frankford, near Philadelphia, April 17.

In the thrashing machine, Calvin Emmons, of New York, April 17.

In the mortising machine, Wm. E. Marsh, Westfield Township, Essex County, New Jersey, April 18.

In the machine for planting and cultivating cotton, Richard Herbert, Williamston County, Tennessee, April 19.

In canal boats, Benjamin Phillips, Philadelphia, April 21.

Improvement on Benjamin F. Brown's standing press frame, Robert Hoe, New York, April 22.

In the revolving hydraulic engine, Asahel Hubbard, Windsor, Vermont, April 22.

In the cogging machine, James A. Post, of Warwick Township, Orange County, New York, April 23.

In the common carriage axle, Daniel W. Phillips and William Maher, the first of Middlebury, and the last of Covington, New York, April 23.

In the churn, Edward Spain, Mount Holly, Burlington County, N. J., April 23.

In the machine for spinning wool, &c., Arthur Cretchfield, Union Township, Licking County, Ohio, April 24.

A composition for making roofs fire and water proof, Daniel Greer, Pittsburg, Pennsylvania, April 25.

In the lever press, William Linn, Danville, Pittsylvania County, Virginia, April 25.

In the plough, John Deats, Middletown, Bucks County, Pennsylvania, April 26.

In the method of effecting the rotatory motion directly from the alternate rectilinear motion of the steam piston, Peter Cooper, New York, April 26.

Improvement, called the portable oven, Francis L. Hedenberg, New York, April 26.

In saw mills, Isaiah Call, Woodstock, Windsor County, Vermont, April 28.

Improvement, called the oyster platform, John Vreeland, of New York, April 29.

In the printing machine or roller press, George W. Cartwright, Mount Pleasant, West Chester County, New York, April 29.

In the act or process of testing leaden pipes for conveyance of water, Theophilus Packard, Shelburn, Franklin County, Massachusetts, April 29.

In the corn shelling machine, Wm. Hoyt, Vernon, Jennings County, Indiana, April 29.

In the saddle, Alexander Marshall, Pikeland Township, Chester County, Pennsylvania, April 30.

In the mode of communicating power and motion by means of metallic bands, Joseph Eve, of Augusta, Georgia, May 1.

A machine for sawing hoops, basket stuff, stuff for making riddles, window curtains and window blinds, Phineas Slayton, Lockport, New York, May 1.

On Isaac Leavitt's washing machine, Eli M. Gibbs, Chenango County, New York, May 1.

In the mode of raising and lowering canal boats, without the aid of locks, William Wiard, Avon, Livingston County, New York, May 1.

In the washing machine, Moses P. Parker, Lowville, Lewis County, New York, May 1.

In the spring and valve marine propeller, William Willis, Charleston, South Carolina, May 2.

In the construction of bedsteads, Silas Hyde, Arcadia, Wayne County, New York, May 2.

In the percussion lock for fire arms, Oren Moses, Malone, Franklin County, New York, May 3.

A machine for cutting plugs for waists and decks for shipping. (This patent was issued on the 28th of June, 1826, and re-issued on account of a defective specification, bearing the same date.) Charles Josselyn, New York, May 3.

In the wheelwright's fellow-lathe, John Setton, Paudleton, and James A. Black, Columbia, S. C., May 6.

In the rope reeding machine, Abraham Boring, and William W. Jones, Thornville, Perry County, Ohio, May 6.

In the double shooting gun or rifle, Silas Mosher and Noble White, Hamilton, Madison County, New York, May 6.

In percussion locks, Jedediah Caswell, Manlius, Onondago County, New York, May 8.

In the cooking stove, Abraham Fisher, Claremont, Sullivan County, New Hampshire, May 9.

In the water wheel, for propelling machinery, &c., John Bell, Sycamore Township, Hamilton County, Ohio, May 9.

In the machine for breaking hemp, John S. Van De Graaff, Scott County, Kentucky, May 12.

In the machine for spinning wool and cotton from the roll, William R. M'Call, Vincennes, Knox County, Indiana, May 12.

In making clay pipes, Thomas Wickersham, Newbury, York County, Pennsylvania, May 13.

In tanning and manufacturing hides into leather, Ebenezer Shove, and Thomas Hunt, Locke, Cayuga County, New York, May 13.

In the improved method of making glass furniture knobs or handles, for which letters patent of the United States, bearing date the 9th day of September, 1824, were granted unto John P. Bakewell, Pittsburg, Thomas Bakewell and John P. Bakewell, Pittsburg, Pennsylvania, May 14.

In the boilers of steam engines, James P. Allaire, New York, May 14.

In the machine for cutting leather in the manufacture of shoes, George P. Mitchell, Burlington, New Jersey, May 15.

In the mortar for pounding rice, John Ravenel, Charleston, S. C., May 17.

In distilling spirits from grain and fruit, Jacob Hugus, Hempfield Township, Westmoreland County, Pennsylvania, May 17.

In the machine for cutting pegs, Hezekiah Thurber, town of Painted Post, Steuben County, New York, May 22.

In the mode of making shingles by machinery, called the Howe and Chaffin Shingle Machine, Stilman Howe and Charles Chaffin, Holden, Worcester County, Massachusetts, May 22.

In the saw frame for sawing veneers for cabinet work, and window sash, and window blind stuff, and tenons, May 22.

In the copper-plate printing press, Cyrus Durand, New York, May 22.

In preparing straw, hay, or other vegetable substances, for the manufacture of paper, William Magaw, of Meadville, Crawford County, Pennsylvania, May 22.

In the machine for cutting and forming wooden screws, Stephen Treadwell, Western, Fairfield County, Connecticut, May 22.

In the thrashing machine, Norton Case, North Granville, Licking County, Ohio, May 22.

In the mode or manner of pressing oil out of flax seed, and other oleaginous seeds, Charles How, Moretown, Washington County, Frederic Brewster, of Colchester, and John Johnson, Chittenden, Burlington County, Vermont, May 24.

In the percussion gun lock, Joseph Lawrence, New Berlin Chenango County, New York, May 24.

In the washing machine, George Hancock, Maysville, Mason County, Kentucky, May 24.

In the machine for the manufacture of horse shoes, Robert E. Horbart, Pottstown, Montgomery, Pennsylvania, May 24.

In the marine railway, John H. Greene, Providence, Rhode Island, May 26.

Improvement, being an oil boiler, or bain marie of oil, for use in refining sugar, and for other purposes, William Augustus Archbald, of New York, May 29.

For a double boiler and other apparatus for refining sugar, and for other purposes, William Augustus Archbald, of New York, May 29.

In the filtering apparatus, to be used in sugar refining, and for clarifying liquids in general, William Augustus Archbald New York, May 29.

In the mill for breaking and grinding tanners' bark, and corn in the ear, John Montgomery, Sangerfield, Oneida County, New York, May 29.

In the gun lock, Nathaniel Saltonstall, New London, Connecticut, May 29.

In the cylindrical printing press, Charles G. Williams, New York, May 29.

In the mode of manufacturing hat bodies, by machinery, at one operation, George L. Thatcher, of Brooklyn, King's County, New York, May 31.

In machinery for propelling ships and other vessels, Anthony Hermanage, Baltimore, May 31.

New Patents Sealed in 1829.

To James Fraser, of Limehouse, in the County of Middlesex, Engineer, for his having invented or found out a new and improved arrangement of a flue or flues, to communicate with the various parts of culinary apparatus, such as steam, soup, or water boilers, oven or ovens, hot plate or plates, hot closet or closets, and stewing stove or stoves, to render them more compact, and to appropriate

part of the said apparatus to effect other useful purposes. Sealed 27th January—2 months.

To John Braithwaite and John Ericsson, of the New Road, Fitzroy Square, in the County of Middlesex, Engineers, for their new invented mode or method of converting liquids into vapour or steam. 31st Jan.—6 months.

To Robert Parker, of Hackney, in the County of Middlesex, a Lieutenant in the Royal Navy, for his having invented an improved drag or apparatus, which is applicable to stage coaches and other wheel carriages, and whereby the motion thereof may be retarded and stopped, when required. 31st January—2 months.

To Joseph Rayner, of Kings Square, in the Parish of St. Luke, Old Street, in the County of Middlesex, Civil Engineer, for his having invented or found out certain improvements in apparatus and machinery for conducting heat, and applying the same in the operations of washing, scouring, cleansing, fulling, dressing, dyeing, and finishing woollen clothes; and in callendering, straining, glossing, polishing, and finishing silks, cottons, linens, woollens, and all other goods, to which the same may be applicable. 5th February—6 months.

To Julius Pumphrey, of Tally Hill, in the County of Worcester, Glover, for his having invented or found out certain improvements in steam engines, and machinery connected therewith, to propel steam boats and vessels, some parts of which improvements are applicable to other purposes. 3d February—2 months.

To Alexander Daninos, of Leman Street, Goodman's Fields, in the County of Middlesex, for a certain invention for the manufacture of improved hats and bonnets, in imitation of leghorn straw hats and bonnets, which invention was communicated to him by a foreigner residing abroad. 5th February—6 months.

To John Burgis, of Maiden Lane, in the Parish of St. Paul, Covent Garden, and County of Middlesex, Ornamental Paper Manufacturer, for his new invented method or methods of gilding or silvering certain woven fabrics in burnished, or burnished and dead, or matted gold, or silver, and which said fabric may be used as gold or silver, and laced borderings, and for other purposes. 5th Feb.—2 months.

To Richard Green, of Blackwall, in the County of Middlesex, Ship Builder, for his having invented certain improvements in the construction of made masts. 5th Feb. 4 months.

To William Henry Kitchen, of High Street, in the Parish St. Giles, Bloomsbury, in the County of Middlesex, Ironmonger, and Andrew Smith, of York Terrace, in the Parish of St. Margaret, in the City of Westminster, Merchant, for their having invented or found out certain improvements in the construction of window frames, sashes or casements, shutters, and doors, designed to afford security against burglars, as well as to exclude the weather. 7th February—6 months.

To Edward Heard, of Devonshire Street, Vauxhall Road, in the Parish of Lambeth, and County of Surrey, Chemist, for his having invented a certain improvement or improvements in illumination, or producing artificial light. 12th February—6 months.

To Samuel Walker, of Beeston, in the Parish of Leeds, in the County of York, Cloth Manufacturer, for his having invented or found out an improved apparatus, which he denominates “an operameter,” applicable to machinery for dressing woollen or other cloths. 20th Feb.—6 months.

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No. XI.
CONJOINED SERIES

Recent Patents.



To WILLIAM CHURCH, of Bordsley Green, near Birmingham, in the county of Warwick, Esq. for his having invented certain improvements in apparatus to be employed in the transportation of goods or passengers ; parts of which said improvements are also applicable to the ordinary purposes of steam engines.—[Sealed 9th February, 1832.]

THE objects proposed under this Patent we alluded to in our comments upon an article written upon steam carriages, in the First Vol. of our Conjoined Series, page 144. We then gave a general idea of the construction of Doctor

Church's new steam coach, and of the peculiar features which it embraced ; the following Specification will exhibit its details :—

These improvements in apparatus to be employed in the transportation of goods and passengers, parts of which are also applicable to steam engines, apply particularly to the construction of locomotive carriages intended to convey passengers and goods on ordinary roads by the agency of steam, and are comprehended under the three following general heads :—

First, the construction of the framing of the carriage which is to support the bodies of the vehicle, and enclose the machinery by which it is impelled, and the manner of connecting the ribs or rails for the purpose of giving great strength from a comparatively small weight of material ;—Second, the peculiar construction of the boilers and flues, by which a sufficient quantity of water may be converted into steam to work the engine ;—Third, the construction of the running wheels of the carriage, designed particularly to prevent concussions, as they pass over inequalities on the surface of the road, which are made with elastic rims, that bend into oblate figures or flatted curves, as they come in contact with the ground, thereby preventing the wheels from sinking or sliding round.

In constructing the framing of the carriage for the purposes stated under the first head, I have endeavoured to form, arrange, and connect the timbers, ribs, rails, rods, tubes, or bars of the same, so as to constitute a skeleton framing, which shall be trussed, and supported in every part and way that is likely to be exposed to pressure, strain, or twist, occasioned by weight, unequal force, or vibration : in order that each timber, rib, rail, rod, tube, or bar of the framing may receive and sustain its due proportion of

weight or strain, and thereby relieve and support the part on which the force immediately acts ; or in other words, that the strain or force may be as equally diffused as possible over all parts of the skeleton frame. And further, I so construct the said skeleton framing, that I am enabled to enclose within it the boilers, engines, and machinery for propelling the carriage, and also to support by it the carriage bodies for the reception of passengers and luggage.

In arranging the parts of the skeleton framing, I form what may be called an engine room, or space for the reception of the engines, boilers, and machinery, about equal in height to that of the bodies of the intended vehicle. In the accompanying drawings (see Plate IV.) fig. 1, represents a side elevation of a complete skeleton framing for a carriage constructed upon the principles above set forth. Fig. 2, is a horizontal view of the same as seen on the top.

When the framing is constructed of wooden rails, as represented in the figures, I connect or unite them together by clips or clamps of iron or other metal, by which means, I avoid the necessity of morticing and tenoning the joints of timber, and retain the entire substance and strength of the wood without having injured the fibres.

The framing may be constructed by connecting rods, ribs, bars, or tubes of metal upon the principles here set out, the junctions being secured by socket joints, fastened by cotters, a specimen of which is shown at A, A, in fig. 1, which are there adopted for the convenience of more readily attaching and detaching the working cylinders and their appendages.

In describing the peculiar construction of the boiler, furnace, and flues, it is to be first observed, that the boiler consists of a combination of tubes filled with water, arranged in vertical positions side by side, in circular or polygonal ranges, so as to form or constitute a furnace, the

fire being in the middle of the system or arrangement of tubes, and the flues are smaller tubes severally passing through the interior of the water tubes. The construction of these boilers will be seen by reference to the several figures descriptive thereof.

Fig. 3, is an external view in elevation of a system of tubes constituting a boiler and furnace, the double casings which form the chimney or outer flue, and the air or blast passage being removed, and partly shown in section.

Fig. 4, is a section of the same, taken vertically through the middle of the boiler and furnace, for the purpose of exposing the water tubes *a, a, a, a, a*.—It will be perceived that these water tubes are arranged in pairs of dissimilar length, and that each pair has a syphon tube *b, b*, passing through them.

Fig. 5, is a horizontal section, taken through the cylindrical steam chamber *c*, above the bends of the cyphons *b*, showing a top view of those syphons, by which their connexions with the several pairs of water tubes will be perceived.

The particular construction of the several water tubes of the boiler, and their connexion in pairs with the syphon flues, are shown at fig. 6, which represents one pair of the water tubes, and their connecting syphon detached from the boiler, and drawn in section upon an enlarged scale; *c, c*, represents a portion of the cylindrical steam chamber, the lower part of which is occupied with water, conveyed through a supply pipe *d*, the level of the water being raised to the height of a few inches above the bends of the syphon tubes *b, b*, as seen in fig. 4.

From this cylindrical chamber the water descends into the tubes *a, a, a, a, a*, and fills them completely; which tubes are secured to the bottom plate of the steam chamber by screwing or otherwise, as shown at *j*.

The flames and heated vapours from the fire, play freely around the external surfaces of those parts of the boiler, which are formed by the ranges of short tubes, and upon those parts of the surface of the range of long tubes which are presented towards the fire, but being confined by the close contiguity of the latter range, the flame and vapours thence proceed up the shorter legs of the syphon flues within the water tubes, and down the longer legs, as shown by the arrows, and having imparted their heat to the water through the metallic surfaces, pass into the dust box, at the bottoms of the longer legs of the syphon, and from thence proceeds up the outer flues *f*, to the chimney *g* : the dust having been arrested in its course by a fine wire gauze sieve or screen *h*, (see figs. 3 and 4,) which is placed as a partition at bottom between the dust box and the lower aperture of the outer flue *f*.

The ends of the syphon flues are secured to the lower extremities of the water tubes by screwed caps *i*, as shown in fig. 6, and in the section of the complete boiler at fig. 4, or they may be otherwise connected, so as to constitute the inner surfaces of the water vessels.

The flues are made in the forms of syphons or bent tubes, not having any attachment to the water tubes at top, which arrangement allows of the metals expanding and contracting under variations of temperature, without disturbing or straining the joints of the metal. The lower extremities of the water tubes may be inserted, by screwing or otherwise into the upper surfaces of annular chambers *k*, and the ends of the syphons into the lower surfaces of the same, as represented in the figures 3 and 4, and for the purpose of promoting a circulation of the water, small connecting tubes *l, l*, are in that case made to lead from one annular chamber to the other.

In order to maintain a constant supply of water at the

lower parts of the boiler tubes *a*, small perpendicular conducting pipes are introduced within, as shown at *m, m*, fig. 6. Both ends of these pipes are open, but a small cap or shield *n, n*, is placed at a short distance beneath the lower aperture. The object of this shield is to prevent the globules of steam, as they form at the bottom of the boiler, from raising up the small pipes; the consequence of which is, that the steam will ascend freely up the water tube on the outside of the conducting pipes, and a constant current of the water will descend through these small conducting pipes *m*, and keep up a continual supply to the bottom of the boiler. One of these pipes and its cap is shown detached at fig. 7; and a horizontal section of the water tube and flue is shown at fig. 8, with six of the conducting pipes *m*, inserted within.

The effect of these internal conducting pipes will be clearly perceived in the diagram fig. 9, where the ascending arrows indicate the course of the steam, and the descending arrows that of the water.

In order to produce the greatest intensity of heat, and the most perfect combustion of the smoke, I supply or inject into the furnace two currents of air, the one on the top of the fuel, which passes downwards through an aperture in the steam chamber, the other at the bottom, proceeding upwards between the five bars *o, o*, meeting the former, whence they pass through the syphon flues *b*, and the outer flues *f*, to the chimney *g*. These currents of air may be obtained by any convenient mode of producing draft or blast, such as a rotary fan or blowing machine, which may be placed above the boilers, as represented in figs. 10 and 11.

Fig. 10, is a side view of the carriage, the framing and the working parts of the machinery being exposed to view. Fig. 11, is a horizontal or plan view of the same. In these

figures are seen the two bodies *B, B*, and the blowing apparatus *C*, above, which stand toward the right hand, and the working cylinders *D, D*, to the left, with the mode of connecting the action of their pistons to the running wheels *F, F*.

The cylindrical case *C*, at top of the carriage contains two horizontal fan wheels upon one axis, the case being divided by a horizontal partition, shown by the dotted line in fig. 10. In the upper compartment the fan revolves for the purpose of injecting air into the furnace, taking its supply from the atmosphere through an aperture and channel *p*, and it forces the air into the casing of the boiler through an opposite channel *q*, seen also in figs. 3 and 4.

It is intended that the air so injected shall be taken from between the engine room and the carriage bodies, in order to keep the latter cool. One portion of the air so injected passes through the apertures *r, r*, of the case, and through the central passage of the steam chamber down into the furnace, producing the upper blast, and the other portion of air proceeds down the outer channel *s, s*, of the casing, (taking up the caloric from the contiguous flue as it passes,) and through the aperture *x*, below, between the fire bars into the furnace, and produces the under blast. The other fan wheel in the lower compartment of the cylindrical case, which is intended to act as an exhauster, brings the vapour from the chimney *g*, and discharges it through apertures *u, u*, into the dome, from whence it escapes to the atmosphere.

The fuel is supplied to the furnace through a cylindrical box or hopper *v*, above. A horizontal slider *w*, intersects the lower part of this hopper closing the mouth of the furnace, and forming a bottom to support the fuel, and a flap or cover at top shuts up the hopper close when the fire requires replenishing, which is done by withdrawing the slider *w*, when the fuel falls into the furnace.

Under some circumstances I find it convenient to embody the principles of the boiler above described (that is, the syphon flues passing through pairs of water tubes) in different forms and modes to those already shown; instead of constructing the outer range of water vessels of cylindrical tubes, as in the previous instance, I form them by two corrugated plates of metal, bolted or otherwise secured together, as shown in the sectional figure 12; *a, a, a*, are the water vessels that constitute the boiler, the sides of which are held together by the bolts *x, x, x*; the syphon flues *b*, are constructed and united to the water vessels by screws or otherwise, as before explained, and the steam vessels *c*, above, is formed by continuing the outside corrugated plates of the water vessels upwards to the required height, and adapting similar corrugated plates for the inside surface of the steam vessel by riveting or otherwise securing such plates to a flat plate, for forming the bottom of the steam chamber, and bracing the sides together by transverse bolts.

The peculiar construction of the running wheels will be seen by fig. 13, which represents the face of one of these wheels complete, and fig. 14, a section of the same, taken transversely. These wheels are of considerable breadth, and also of large diameter; they are formed by the union of several hoops *a, a*, of elastic wood, connected together and secured by clamps *b, b*, bound round the hoops, as shown in the two last mentioned figures, which constitute the felly or rim. The outer periphery of the wheel is bound by a hoop of iron *c, c, c*, forming a tire, and the spokes consist of elastic curved plates of steel or springs *d, d, d*, bending and moving upon joints. The outer ends of all the elastic spokes *d*, are attached to the felly by joints at the backs of the several clamps, and the reverse ends of these elastic spokes are connected by joints to a pair of metallic rings *l, l*, firmly fixed by radial and diago-

nal rods *f, f, f*, to the nave or metal box *g*, of the wheel in the centre.

These running wheels are fixed upon short rotary axles *h*, and the weight of the carriage bearing upon these axles, causes the peripheries of the wheels to bend into slightly oblate figures, or flatted curves, as they pass over the road. This deviation from the circular figure of the wheel, by its increased surface, causes the wheel to take firmer hold of the ground, and consequently to be less liable to slip round, or sink into the road.

The springs thus introduced into the wheels, it may be observed serve as substitutes for the springs usually employed in hanging carriage bodies; but in order to afford greater elasticity and ease of action to the carriage, I have recourse to the following means:—A cylindrical box *i*, containing air, and closed at top, is attached firmly to the frame work, as shown in figures 10 and 11. In this cylindrical box a piston *k*, shown by dots in the side view, fig. 15, is fixed on the top of a forked yoke *l, l*, which plays freely up and down, and is made tight by a leather cup at its upper part in the usual manner of packing hydraulic presses, and the lower ends of the yoke have eyes or bearings in which the short axles *h*, turn freely. By injecting a sufficient quantity of air into the vessel *i*, an air spring is produced, upon which the weight of the carriage and its burden bears, and through the medium of the pistons and the yokes that weight is supported by the running wheels.

As the axles of the wheels would be liable to lateral movement unless restrained, I make use of jointed rods *m, m*, and *p*, seen in the horizontal representation of the wheel and its appendages at fig. 15. These rods *m, m*, are connected at one end to the framework by hinge joints

u, u, and at the reverse end by rings *o, o*, to the axles, (see the side elevation detached at fig. 16, and edge views fig. 17.) The rod *p*, it will be perceived is connected to the inside of the wheel axle by a ball and socket joint, shown in the section of the wheel and its axle at fig. 14, and therefore while it holds the axle firmly endwise will not impede its motion. By means of these rods the carriage will be allowed to vibrate in vertical directions.

For the purpose of preventing the escape of air past the piston in the box *i*, I inject a small quantity of oil, water, or other liquid, by means of a small force pump. This force pump may be occasionally employed to inject air, and consequently the elasticity of the spring may be accommodated to the weight of the burthen it may have to sustain.

Although I have described air boxes and pistons, I wish it to be understood that I do not intend to confine myself to air springs, as under some circumstances it might be found desirable to employ metallic springs.

The power exerted by the working cylinder and pistons of the engines, is communicated through the piston rods to the crank shaft *s*, in the usual way, and a pulley *t*, (see fig. 16,) fixed upon the crank shaft, drives the running wheels by means of the endless chain *u*, carried over a similar pulley *v*, on each of the running wheel axles, shown in operation in figs. 10 and 11. But as it is necessary to vary the propelling power, I have also introduced two chain pulleys *w*, and *x*, of dissimilar diameters upon the said crank shaft and wheel axle, with an endless chain passed over them, (see figs. 15, and 17.) Both the pulleys upon the wheel axles turn loosely, and either of them may be locked into gear by means of the sliding clutch boxes *y, y*, with the levers and rods *z, z*.

In describing the general construction of the carriage

shown at figs. 10 and 11 ; A, A, is the skeleton or frame work of the carriage B, B ; are the two boilers within their casings ; D, D, are the engines, which are of a similar construction to that described in the Specification of a Patent granted to me by His present Majesty, dated the 29th day of November, 1830, (see Vol. VIII. of the London Journal of Arts, Second Series, Page 1,) but these engines are in the present instance reversed in their positions, hanging pendant from their induction and eduction steam pipes, and turning in the bearings at the upper end of standards *b, b, b* ; E, is the crank shaft turning in bearings upon the frame work, which is kept in its proper place by the screw bolts *a, a*, on the end of the upright piece *b*.

The crank shaft gives motion through the chain pulley *c*, and endless chains *d*, to the chain pulleys or riggers *e*, mounted upon the axles of the running wheels F, F ; upon their axles also are mounted the other chain pulleys *f, f*, connected by endless chains *h, h*, to the other pulleys *i, i*. Upon the crank shaft *k, k*, are the clutch boxes keyed to the axles of the running wheels, with their levers *l, l*, connected by the rods *m, m*, to the lever *n*, by which the clutch boxes may be slidden from one pulley to the other, so as to alter the speed of the running wheels, as described.

The cylinders *i, i*, contain the air springs, with the pistons on the tops of the forked rods *l, l*, and support the carriage ; *n*, is the fuel feeder or hopper ; *o*, is the safety valve and steam pipe leading to the engines ; *r, r*, the pipe for conveying the eduction steam from the engines to the chimney *g* ; *c*, is the hood or dome, containing the blast and exhausting fans or blowers, as before described. Upon the under side of the lower fan is fixed the pulley *t*, which communicates rotary motion to both of them from the endless band *u, u*, which is passed over pulley *v*, and the larger pulley *w*, upon the crank shaft E ; H, H, are the bodies of

the carriages for the conveyance of passengers ; κ, κ , are spaces, which may be used for the depositing of luggage.

The reservoir for water to supply the boilers may be placed under the chain-rigger on each side of the engine room, and those for fuel above them, so as to leave a clear open space for the engineer in the middle ; or they may be placed in any other convenient part of the carriage ; L , is the pilot wheel, under the control of the conductor stationed on the front seat of the carriage. This pilot wheel is mounted on a circular framing $1, 1$, and turns in bearings in the ends of the elevated rods 2 , strongly braced to the circular frame ; the upper ends of these rods are bolted or connected together on the ends of the shaft 3 . This shaft has a collar, with a strong metal spring contained in the box 4 , resting upon it. This spring box is firmly fixed into the end of the stem or a poll 5 , of the carriage ; 6 , is a toothed quadrant fixed upon the shaft 3 , into which the pinion 7 , having only two teathed gears ; this pinion is attached to the vertical rod 8 , having a horizontal winch handle 9 ; and when the conductor turns this handle round, the pinion will move the quadrant 6 , and hence, through the shaft 3 , the wheel L , also, and its circular frame, will move round within the outer circular rim 10 , which is fixed to the carriage.

There is a speaking pipe 11 , or tube, through which the conductor can communicate any directions to the engineer ; 12 , is an angular shaped piece of metal suspended to the under side of the frame work just before the running wheels, and nearly touching the ground, and is there placed for the purpose of removing any loose stones or other obstruction out of the track or way of the wheels, by which one cause of jolting or shaking will be avoided, and in case it comes in contact with any fixed obstruction, the chain will allow it to rise up. .

In order to prevent the destruction of the fire bars by the heat of the furnace, I make them of a trough-like form, the hollow of which bar I file with fire clay or black lead, or other material, which will resist the action of heat.—
[Inrolled in the Rolls Chapel Office, August, 1832.]

Specification drawn by Messrs. Newton and Berry.

To JOSHUA TAYLOR BEALE, of Church Lane, Whitechapel, in the county of Middlesex, engineer, for certain improvements in steam engines.—[Sealed 28th March, 1832.]

THIS is a peculiar construction of steam engine, in which the cylinder moves up and down upon a fixed piston. The following is the Patentee's description of the machine:—

“ My invention consists of a peculiar combination or arrangement of certain parts of a steam engine, whereby the steam cylinder is caused to be actuated on a fixed hollow piston rod ; the hollow piston rod serving as an induction, as well as an eduction way for the steam, as will be fully described hereafter.

Plate V. fig. 1, is a front elevation of an engine, constructed according to my invention. Fig. 2, a side elevation of the same ; and fig. 3, is a section of fig. 1. Figs. 4, 5, and 6, show some of the parts separately, whereby their construction may be more readily understood. In each of these figures the same letters of reference are used to indicate similar parts wherever they occur.

Four pillars *a, a*, are screwed to the four corners of two rectangular framings *b*, and *c*, and thus is formed the fram-

ing on which the engine is mounted; *d*, is the steam cylinder; the covers *e, e*, having stuffing boxes, through which the piston rod *f*, passes. This piston rod is hollow, as will be seen in the section at fig. 3; and it will also be perceived, that the piston rod is fixed at top and bottom in framings *b*, and *c*. This hollow piston rod serves as an the induction, and also an eduction pipe for the steam to pass to and from the steam cylinder.

The piston *d*, is affixed to the piston rod *f*, (see fig. 3,) and this piston is similarly constructed to those in general use, except that there are valves *h*, and *i*, formed therein, which admit of the steam to flow to and from the steam cylinder, as will be fully described hereafter. The steam pipe *j*, leads from the boiler, and is connected to the hollow piston rod *f*, at *k*.

At the top of the piston rod there is a stuffing box formed, through which passes the rod *l*; this rod *l*, is affixed to the valve *m*, and by this rod the valve may be raised from its seat, either by the lever *n*, or the lever *o*; the lever *n*, having its fulcrum at *s*; and the lever *o*, is a bent lever, having one end turned at right angles, which is affixed under the lever *n*, at *p*, and thus causes the valve *m*, to rest on its seat when not acted upon by the wipers 2 and 3, affixed on the main shaft *r*, or by depressing the lever *n*, by hand.

The main shaft *r*, turns in four bearings *s*, and has two cranks *t*, which are acted upon by the connecting rods *u*, attached to the framing on which the steam cylinder *d*, is affixed.

This framing is called a cradle, and consists of a strong square frame *v*; the steam cylinder being affixed to the framing *v*, by axes or pivots *w*, one on each side of the cylinder, by which a slight motion may be obtained without derangement to the cylinder, and thus the cylinder

will be free to move perpendicularly on the piston rod, even though any of the parts may be slightly inaccurate, which would not be the case were the framing incapable of allowing this slight motion.

On to the side frames x, x , of the framings or cradle v, v , are formed axes or pivots y, y , to which are affixed the connecting rods u , and also the friction wheels z, z . These pivots or axes y, y , also allow of a slight motion without derangement of the steam cylinder, in an opposite direction to that already described, and are intended for the same purpose.

At the front and back of the steam cylinder d , there are placed two perpendicular guides $4, 4$, between which the wheel z, z , work, as will be readily understood by examining the figs. 1 and 2.

Fig. 4, shows a separate view of the piston g , and fig. 5, is a metal ring, which is to be screwed down within or without the nuts of the piston, to keep them from coming off.

Fig. 6, shows the separate parts of the piston rod in section, and the manner in which the piston is connected thereto. By this figure it will be seen that the piston rod is formed of two pipes or tubes, having each a flange, by which the same is affixed to the piston by screws.

It will be desirable here to observe, that in an engine having but one cylinder, it will be necessary to weight the fly-wheel, in order to balance the steam cylinder d ; but where two cylinders are used, it will be evident that the same may be so applied to the main shaft as that each cylinder shall act as a partial counterbalance to the other, whether the same be for high or low pressure engines.

Having now described the manner of combining the various parts of a steam engine according to my invention, I will explain the manner of its action, in doing which I

will suppose the steam to be coming from a steam boiler by the steam pipe *j*, and that the wiper 3, on the main shaft *r*, is acting on the lever *o*, and thus, by the rod *l*, causing the valve *m*, to be lifted off its seat, by which means the steam will pass into the hollow piston rod, and thence into the steam cylinder, between the upper cover of the steam cylinder and the fixed piston, through the valve *h*.

This valve consists of two ground plates affixed on the same spindle, which acts through guide holes formed in bridges across the openings in the piston *g*, as seen in fig. 4.

Thus the upper cover of the steam cylinder having pressed down the valve on to its lower seat, which is also ground, the upper part of the valve is left open for the passage of the steam from the piston rod into the upper part of the cylinder, causing the same to recede from the fixed piston until the lower cover of the steam cylinder comes in contact with the spindle of the valve *h*, and causes the upper part to be closed, and the lower valve to be opened, to admit the steam to flow to the under side of the piston, and to cause it to press the steam cylinder from the fixed piston on that side.

At the same time that the valve *h*, is closed to the upper part of the steam cylinder, and opened to the lower part thereof, the valve *i*, comes in contact with the lower cover of the steam cylinder, and opens the upper part of that valve in such manner that the steam which has already caused the upper part of the cylinder to recede from the piston, passes into the lower part of the hollow piston rod, and thence off, either to a condensor, or to the open air, according to the construction of the engine; and when the upper cover of the steam cylinder again comes in contact with the valves *h*, and *i*, the steam will again flow into the upper part of the cylinder, and the eduction way

will be opened for the steam to pass from the under side of the piston, which is the position shown in fig. 3. It is to be observed that it is desirable the spindles of the valves *h*, and *i*, should have springs, or otherwise sufficient friction to prevent their closing when they have been forced into their proper positions, by the covers of the cylinders coming in contact with them.

It has been already described that the steam is admitted by the valve *m*, to the hollow piston rod, and the quantity of steam for each side of the piston is admitted by the wipers 2 and 3, coming in contact with the lever *o*, which is always kept pressed down by the spring 5, and the quantity of steam admitted to each stroke will depend on the time the valve *m*, is kept open, and therefore the length of the wipers 2 and 3, will determine the quantity of steam admitted ; and thus may be regulated in case the steam be used expansively the extent of the stroke during which the steam is admitted, and then shut off, that the remainder of the stroke may be completed by the expansion of the steam.

In starting the engine, the lever *n*, is to be depressed by hand, which will open the valve *m*, and admit the steam to the steam cylinder. It will be seen in fig. 3, that there is a division or partition 6, in the piston rod, which divides the same into two parts, the upper one acting as the induction pipe for the steam to the cylinder, and the other, or lower part, as an eduction pipe for the steam from the cylinder.

In case this engine is intended for a low pressure engine, there is to be a pipe leading to the condensor, affixed to the lower part of the piston rod ; or when the engine is intended for a high pressure engine, there is to be a pipe affixed, leading to the chimney of the furnace, or to the open air.

In starting the engine, I cause the bottom cover of the steam cylinder to act against the valves *h*, and *i*, which I effect by turning the fly wheel till I bring the crank nearly to the dead point ; these valves are thus opened in such a manner that the steam will blow through on both sides of the piston, and thus heat the steam cylinder.

When it is a small engine, I turn, by means of the fly wheel, the cranks over the dead point, in the direction the shaft is to be driven, this will put the valves in their proper position ; but in large engines, or where two cylinders are used, (more particularly in marine engines), it will be necessary to be able to change the position of the valves *h*, *i*, at any period of the stroke, for the purpose of changing the direction of the cranks of the main shafts, for the purpose of backing the engines. In this case, I attach rods, such as are shown by dotted lines in fig. 3, to the spindle of the valves *h*, *i*, which pass through stuffing boxes formed on the top cover of the steam cylinders : these rods are connected at the top by a forked lever (see fig. 7), by which means they are moved together.

When it is desirable to change the position of the valves, to alter the direction of the cranks, the throttle valve or cock on the steam pipe from the boiler must be closed, in order to stop the passage of the steam, which will thus stop the engine ; the rods connected to the valves *h*, *i*, must then be raised or lowered by the dotted lever, as the case may be, which will raise or lower those valves, and cause them to change the direction of the action of the steam, and consequently the cranks (taking care, if it is a large single engine, not to stop it on the dead points) ; and in order to remove readily the wipers from under the lever *o*, at any time when the engine is required to be backed, the wipers 2 and 3, are formed on a tube which slides on the main shaft *r*, there being two pairs of wipers thereon, so that

when one pair is slid away, the other pair will be so placed as to come into action if required.

Fig. 2, shows the means of moving the wipers. On the tube is formed a clutch, into which enters one end of the lever *b*, and it will be seen that if the lever *b*, be turned on its axis, it will force the tube which carries the wipers along the main shaft, and the tube is prevented from turning by means of a feather, which is well understood.

Having described the manner of combining the various parts according to my invention, and also the manner of their action, it will be evident that although I have described and shown the piston rod as being fixed vertically, the same may, in some instances, be used horizontally, or in a diagonal direction; and I would have it understood that I lay no claim to the various parts separately, of which the engine is composed, they being well known and in use; neither do I confine myself to the precise construction of the various parts as shown in the drawing, as the same may be, in some degree, varied.

What are shown and described I have found to answer, and conceive to be the best arrangement; but what I claim as my invention, is the peculiar arrangement or combination of the various parts of a steam engine, whereby the steam cylinder is caused to be actuated on a fixed hollow piston rod, such hollow piston rod serving as an induction as well as an eduction way for the steam to and from the steam cylinder.—[*Inrolled in the Inrolment Office, September, 1832.*]

To ROBERT JAMES HENDRIE, of Blossom-street, Shore-ditch, in the county of Middlesex, dyer, for his invention of an economical mode of improving dyed silk.—
[Sealed 3rd May, 1832.]

THE subject of invention claimed under this Patent applies solely to the cleansing of a peculiar kind of silk during the dyeing process.

Silk, which is to be dyed of the colour denominated by the Patentee *Imperial or blue black Dounce*, is dyed in the skein: that is, in bundles or hanks of threads, slightly twisted together. After the silk has been immersed in the dyeing material, a considerable quantity of foul matters are found attached to its fibres, so that a great labour and time is requisite to beat out and wash the silk clean by hand. In order therefore to expedite the operation, and of course render it more economical, the Patentee has discovered that the hand labour may be advantageously superseded by the employment of machinery.

Any kind of washing machinery which will sufficiently beat out and cleanse the material, may be used for the purpose, but the ordinary fulling stocks, such as woollen clothiers commonly apply to washing and milling cloths, are proposed as most eligible. The skeins of silk are put into bags made of *safe canvass*, and when placed in the stock, a continued stream of clean water is allowed to run through the stock during the operation, for the purpose of cleansing the silk perfectly.

The claim of invention is the employment of stocks or other machinery of that kind instead of hand labour, for the washing of silk dyed in the skein of the colour called blue black Dounce.—*Inrolled in the Inrolment Office, November, 1832.]*

To WILLIAM DAUBNEY HOLMES, of Saint John's Square, in the county of Middlesex, engineer, for his having invented or found out a new method of heating houses and other buildings, and of supplying heat to various manufactures, and other purposes.—
 [Sealed 19th July, 1832.]

THE subject of this invention is simply the employment of heated oil, or any other liquid, the boiling point of which may be at a higher temperature than that of water, for the purpose of communicating heat by its circulation through a continuous range of pipes placed round a building, in the same way that water has been recently employed for warming rooms, manufactories, and hot houses.

It has been long known that oil, under the ordinary atmospheric pressure, will retain a very considerably greater quantity of heat than water before it passes into the state of vapour or steam. Taking advantage of this knowledge, Messrs. Severn, King, & Co. of Whitechapel, formerly surrounded their sugar pans with boiling oil as a heating medium, which mode of evaporating syrups they continued to practise until the unfortunate and memorable explosion of the oil, which, with its attendant conflagration, totally destroyed their premises.

The employment of heated oil, as proposed by the Patentee, is not confined to any particular shape or construction of apparatus, as its application to heating is claimed generally under every form in which a continuous current of the fluid can be obtained. But for the purpose of illustration only, the plan of an oven to be heated by a continuous range of pipes conducting heated oil, is appended to the Specification.

Plate V. fig. 8, represents the contrivance as it would appear in a horizontal or plan view; *a*, is the oven sur-

rounded by a double casing *b, b, b, b*, which forms a chamber or vessel to be filled with oil; *c, d, e*, is a continuous range of pipes leading from the bottom part of the chamber *b*, at *c*, and delivering into the top part of the chamber *b*, at *e*. A vessel of oil is placed at *f*, from which the pipes and the chamber may be filled, and *g*, is a valve to let off the air which may previously occupy the pipes.

In some convenient part of the range a furnace or heating stove is to be applied to the pipe, by which the temperature of the oil will be raised, and consequently from the levity it has then acquired, will flow up the ascending pipe and enter the chamber *b*, or the upper part *e*; then circulating round the chamber as shown by the arrows, it will give out its heat to the oven *a*, and being slightly reduced in temperature, will descend by its superior gravity, and pass off at *c*, through the continuous range of pipes *d, d, d*.

The oil becoming heated in its course through the range of tubes *d, d*, by the fire of the stove or furnace, it will by its increased temperature again pass up into the vessel at *e*; a continuous current of the heated fluid will then be produced, which will effectually heat the oven in passing round.

For the purposes of baking, the Patentee proposes to raise the temperature of the oil to 400° Fahrenheit, but for other purposes, of course the degree of heat required will depend upon particular circumstances: and the employment of oil as a heating medium affords the ready means of regulating the temperature to any degree that may be desired.—[Inrolled in the Inrolment Office, December, 1832.]

To MILES BERRY, of Chancery Lane, in the parish of Saint Andrew Holborn, in the county of Middlesex, civil engineer, and mechanical draftsman, in consequence of a communication made to him by a certain foreigner residing abroad, for certain improvements in the construction of presses applicable to various purposes.—[Sealed 26th July, 1832.]

THESE improvements in the construction of presses applicable to various purposes, consist in the adaptation of *rotary toggle joints*, or *jointed levers*, placed upon a revolving shaft, which when brought into a right line, effect the pressure upon the article submitted to its operation.

This mechanism is applicable to various kinds of presses employed for making nails or rivets, heading screw-shafts, bolts, or pins, making buttons, coining money, striking dies upon metals, and embossing cards or paper, and other materials; the improvements consisting in obtaining the pressure by means of rotary arms with toggle joints, or jointed levers, in any kinds of presses to which the same may be applicable.

As the minute parts or details of the press must necessarily vary according to the description of press to which these improvements are to be adapted, and the kind of work intended to be performed, it is only necessary to describe a simple application of these improvements in a press which may be used for coining money, or stamping, or striking dies.

The several figures in the accompanying drawing (see Plate V.) and the following description will sufficiently explain the principles and action of the rotary toggle joints, or jointed levers, in producing the required pressure upon the article to be struck in the press.

Fig. 9, is a front elevation of a press ; and figs. 10, 11, and 12, are side views of the same, partly shown in section ; that is, one of the side frames being removed in order to exhibit the different positions of the mechanism more perfectly ; the same letters of reference being marked on similar parts in all the figures.

The frame work of the press represented at *a, a, a*, may be made of metal or wood, and constructed to suit the particular purpose for which it may be intended to be used ; *b*, is a shaft, mounted in suitable bearings in the side frames, and turned by a winch or other convenient means. Upon this shaft is securely fixed the arm, or lever *c*, carrying the toggle joint, and the outer lever *d* ; at the extremity of which lever is placed the stamp, die, or cutter ; *e*, is another shaft, also mounted in bearings in the side frames, and from which extend the arms or block pieces *f, f*, having the under or counter dies at their extremities.

The ends of these arms or blocks are alternately brought into contact with the upper die, as they both revolve by means of the toothed wheel *g*, mounted upon the shaft *e*, taking into another toothed wheel *h*, upon the shaft *b*, of half its diameter, which causes the shaft *b*, to revolve with twice the velocity of the shaft *e*.

A holder or piece of metal *i*, counter sunk or otherwise formed for the upper die, is placed between guides *k, k*, fixed on the outer toggle lever *d*, and which die holder *i*, is allowed to slide up and down within the guides, and is forced downwards by the action of a helical spring *l*, coiled round the outer toggle lever *d*, within the guides ; as may be seen in the detached view of the outer toggle lever, fig. 13, where the guides are removed from one side, and the helical spring *l*, shown in section the better to expose the parts, and a small ledge upon the ends of the guides *k*,

(see fig. 9), prevents the spring *l*, from projecting the die holder *i*, beyond its place.

In order that the two dies as they revolve may meet each other fairly and correctly, the outer toggle lever *d*, with the die holder *i*, is pitched forward at an angle so as to bring it into a right line with the centres of the block pieces *f*, as they come up to the point of meeting (as shown in fig. 10.) This inclined position of the lever is produced by the force of the spring *m*, fixed upon the boss of the inner toggle lever or arm *c*, the end of the spring *m*, being connected by a bridle piece *n*, to the outer toggle lever, as shown in the figures, and by these means the lever is returned in the inclined position, after each impression has been given. The extent of this obliquity of the toggle lever *d*, is determined by a regulating screw *o*, on the end of the arm *p*, fixed upon the outer toggle lever, which screw comes in contact with the inner toggle lever between each impression.

On the wheels *g*, and *h*, being put into motion by a winch or other means in the direction of the arrows, the shafts *b*, and *e*, will revolve in opposite directions; and in consequence of the difference of the diameters of the wheels, the toggle levers *d*, will revolve with double the speed of the block pieces *f*, *f*.

By this rotation of the two wheels and their shafts, the block pieces *f*, *f*, carrying the lower dies, are alternately brought into contact with the die holder *i*, at the end of the outer toggle lever *d*, which are the periods of the dies coming into operation.

On the die holder *i*, at the end of the toggle lever *d*, meeting one of the block pieces *f*, the ends of the guides *k*, *k*, first strike against a transverse pin *q*, fixed at the back of each block piece *f*, and as the rotary progress of the block piece *f*, is slower than that of the toggle levers, it follows

that the outer toggle lever *d*, will be retarded, and forced by the resistance of the pin *q*, against the guides *k, k*, into a perpendicular position, as at fig. 11, the guides *k, k*, sliding against the pin *q*, the spring *m*, bending, and the press now exerting its maximum of power.

The pinch of the dies or cutters fixed at *i*, takes place in the line of the centres of the toggle joint as it passes the centre of the block, and of the shafts or axles, and by these means a central impression is given by the dies to the material operated upon.

Fig. 10, as before said, shows the positions of the parts of the press at the period that the block first meets the upper die holder, which is thrown outwards to meet the counter die, by the action of the helical spring *r*. Fig. 11, shows the position of the press at the period that the toggle joints and blocks are passing the centres, and the dies are giving the impression, the die holder *i*, being forced against the end of the outer toggle lever *d*, by the resistance of the block piece *f*, the helical spring *l*, giving way to the pressure. Fig. 12, shows the press after the impression has been struck, and the toggle joints and block have passed the centres, the toggle levers *c*, and *d*, moving round to meet the other block piece *f*, as it rises, when they will act in the same way as described, and produce another impression.

The size of the toothed wheels and their proportions to each other, the length of the toggle levers and block pieces, the relative speed of one shaft to the other, the number of toggle joints or levers, and the number of block pieces, may all be varied by different arrangements and proportions, retaining however the same principle of action in the process.

The materials to be impressed, stamped, struck, cut, or otherwise operated upon, may be placed in either the upper

or lower die, or between the two, or introduced or fed into the press by hand, or by any convenient machinery, such as a feeding table, which may be brought between the toggle levers and block pieces after each impression, by the motion of a crank or lever ; but as the manner of feeding or introducing the material into the press must vary according to the character of the material operated upon, and description of work to be performed, it is not necessary to describe any particular mode of effecting the same.

The improvements claimed under the above Letters Patent, are the application of rotary toggle joints, or jointed levers, in connexion with the blocks or other such necessary resisting parts to produce the required pressure in the manner herein described, and the adaptation of the said contrivance to all presses to which the same may be applicable.—[*Inrolled in the Rolls Chapel Office, January, 1833.*]

Specification drawn by Messrs. Newton and Berry.

To JAMES PYCROFT, of Rolleston, near Burton on Trent, in the county of Stafford, gentleman, for his invention of certain improvements connected with grates, and other fire places.—[Sealed 13th July, 1831.]

THIS invention consists in a particular arrangement and construction of grates or fire places, whereby much of the heat heretofore lost, is made available in heating a quantity of air, either from the room in which the fire is contained, or from an inlet from the outer atmosphere ; and such heated air may pass into the same room in which the fire is contained, or be conveyed to other rooms as may be desired.

In order to carry the invention into effect, the Patentee says, he constructs the sides, top, and part of the back of

the grate or fire place hollow with proper inlets and outlets for the air to such hollow chambers.

In Plate V. fig. 14, represents the front view of a grate or fire place, constructed according to my improvement. Fig. 15, is a side section thereof, and fig. 16, a horizontal section. In each of these figures *a*, is the fire place for the fuel; *b, b*, are the registers or inlets for the cold air, when such air is derived from the room; *c, c*, are outlets for the air when it has become heated, by passing into the hollow chambers *d, d*, formed at the sides, back, and top of the grates or fire places; *e*, is the flue, which is shown as being of a rectangular form, but other forms may be used.

This flue it will be seen, stands back from the fire, the fire being brought as forward as possible, with a view to throwing as much heat as can be into the room; yet as such bringing forward of the fire would tend to cause the smoke to enter the room in place of going up the chimney, and in order to prevent this, I use a shield or cover, which will descend and cover the upper part of the fire, and which at the same time acts as a blower to excite the fire; *f*, is the front part of the cover, which is hinged to the upper part of the grate or stove, on the inner side of which the part *g*, slides, so as to elongate the cover or shield, when the same is drawn outwards for the purpose of covering the fire, as shown by the dotted lines in fig. 15.

This part *g*, has slits cut into it, and also pins or studs formed in the inner side of the part *f*, which allows of its being drawn down, but it is yet retained in any position, by means of a screw pin on the top of the shield and rack, affixed on the side of the part *f*, as shown in the figure.

When the fire is lighted, and fresh coal put on, the cover or shield *f, g*, should be drawn down so as to close the upper part of the fire, and thus will the black smoke be directed up the chimney; and when the coal has burned

up, the cover or shield may be slid up, and be placed level with the surface of the back of the stove, and only leave a small place for the smoke to pass to the chimney.

It will be evident that so long as a fire is in the grate or fire place, the air which is contained in the hollow chambers will become heated, and will pass off at the openings or outlets *c, c*, into the room.

In case the air so heated be desired to be passed into other rooms, then the outlets *c, c*, are to be closed, and apertures into tubes or pipes, placed for that purpose, are to be opened, when the heated air will pass into any other room which is connected by pipes for that purpose.

In place of permitting the air of the room to enter into the flow chambers *d, d*, I generally use pipes connected with the hollow chambers, and open to the outer atmosphere, in which case the apertures *b, b*, must be opened; *h*, is a damper placed a short distance up the chimney or flue, by which the extent of draft may be regulated, or wholly shut off when required; *i*, is a small door, through which the hot air may be conveyed into the chimney when not wanted.

Having now described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim as my invention is the forming hollow chambers to grates or fire places in the manner above described, for heating the air either of the room in which the fire is lighted, or for supplying such heated air to other rooms by means of pipes connected therewith; also the particular construction and arrangement of the bonnet or shield with hinges, applied to such hollow chambers.—[*Inrolled in the Inrolment Office, January, 1832.*]

To PETER YOUNG, of Fenchurch-street, in the city of London, rope and sail maker, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of a new mode of manufacturing mangel-wurzel, for the purpose of producing various known articles of commerce.—
 [Sealed 6th October, 1831.]

THE intention of the Patentee is to employ mangel-wurzel or beet-root, as a material for producing first, a liquor for the purposes of distillation, and from which a pure spirit may be obtained ; secondly, a wash to be converted into vinegar ; and thirdly, a pulp from which paper may be manufactured.

In adapting the mangel-wurzel to these purposes, the roots are first to be washed, and scoured perfectly free from dirt, then the rind is to be taken off by rasping, and it is to be placed in cloths or bags, made of twilled woollen, or horse hair, and submitted to pressure by means of an hydraulic press, or other suitable means, for the purpose of expressing the juice.

The juice thus extracted is to be placed in a boiler, and its temperature raised to somewhere about the boiling point ; and with it is to be mixed and well stirred up a quantity of diluted sulphuric acid, in the proportion of about ten ounces of acid to one hundred gallons of the juice.

After about twelve hours, the juice is to be drawn from the boiler into a vat, and allowed to cool, which cooling may be expedited by the use of a refrigerator. When the liquor is reduced in temperature to about 70° Fahrenheit, then lime or other alkaline matter is to be introduced into it for the purpose of neutralizing the acid, which material must be continued to be applied until the liquor ceases to

effervesce. Yeast is then to be added for the purpose of causing the liquor to ferment, and when the fermentation has been carried on as long as it will act, the liquor is considered to be ready to be operated upon by the still, by which a very pure and fine spirit may be obtained.

The pulp of the mangel-wurzel which remains in the bags may be steeped in water, and being again submitted to pressure will give out a liquor, that if mixed with a portion of sugar, may be employed for making vinegar by the ordinary process.

The fibrous parts of the root after the steeping and pressing, are to be washed with diluted sulphuric acid or chlorine, in order to bleach them, and this being done, the chemical matters washed perfectly away, the pulp will be found in a state fit to be employed for making paper.

The quality of the paper produced from this material will be improved by mixing with it from ten to fifty per cent of fine linen rags, which will render it fit for making fine white or coloured papers; if it is mixed with ropes or hemp, it may be converted into brown or other common papers.—[*Inrolled in the Inrolment Office, April, 1832.*]



AMENDMENT OF THE LAWS

RELATIVE TO

PATENTS FOR INVENTIONS.



IN consequence of notice given in the House of Commons by MR. GODSON, the Member for Kidderminster, of his intention to introduce a Bill into Parliament for altering

and amending the laws which apply to Patent Inventions, an article appeared in the Times newspaper, purporting to be a sketch of the plan about to be proposed by the Hon. Member.

Considering it desirable to call public attention to this subject, we inserted in that paper, as a reply, the following letter, which will sufficiently show our views upon the general question :—

TO THE EDITOR OF THE TIMES.

SIR,—Seeing an article in your paper of yesterday, pointing out the objects of Mr. Godson's Bill, about to be submitted to Parliament for amending the laws relating to patents for inventions, we take the liberty of offering a few observations on that subject.

It is a matter of great importance, in a country like this, in which inventive talent so eminently flourishes, to obtain a code of laws which shall give to the productions of scientific genius the same protection that is afforded to literature, and to remove every impediment which may obstruct the growth of improvements in our arts and manufactures.

In proposing, however, remedies for existing evils, we must not stumble over shadows, but attack those defects in the existing system which really operate as grievances, and produce extensive injury. You say "the principal improvement contemplated appears to be in the mode of obtaining the patent and the description called the specification. Inventors have long and loudly complained that their time was wasted by journeys to the office of the Secretary of State, the Privy Seal, and the Signet." If such should be the primary objects of the Bill, it is founded

ed in error. Is it not a matter of grievance to patentees that they have to travel to and fro, through a series of offices, at great labour and inconvenience, before they obtain the great seal; this drudgery is performed by the clerks of the patent agents, and it is perhaps a labour which few patentees are aware of occurring.

In seeking to supersede this unnecessary parade of offices we should be attacking vested rights of many persons, and the ancient prerogatives of the Crown; let us, therefore, leave these matters to be dealt with by the law officers as they see fit; on this point we only ask a *reduction of the exorbitant fees and stamps* charged in obtaining a patent, which operate as a severe tax on ingenuity, and too often crush the efforts of humble genius.

The important feature sought to be obtained is a certain code of laws for the protection of new inventions and discoveries, by which the intentions of the Legislature may be clearly seen, instead of leaving all questions relative to this kind of property to be decided by precedents in our courts of law, or by the varying opinions of the judges of the day.

To strike out a scheme which should meet all the exigencies of the case would extend this letter beyond a reasonable limit; as, however, we are tolerably well acquainted with the defects of the existing laws, and also with the opinions of patentees in general, in different parts of the kingdom, we shall probably, at a future day, find occasion to solicit your insertion of some farther remarks on this subject, for the purpose of eliciting the views and opinions of those who are most interested in patent property.—We are, Sir, yours, &c.

NEWTON AND BERRY.

Office for Patents, Chancery-lane.

Subsequently to this, Mr. Godson has obtained leave to bring in a Bill for the purpose of amending the Laws relative to the granting of Patents, and the practice of the Courts in examining such subjects. The Honorable Member explained his proposed Bill at considerable length, and which indeed we may consider to be tantamount to reading the Bill itself.

He first recited the Act of James I, respecting monopolies, for the purpose of repealing the 6th Section of that Act, and proposed that all future monopolies respecting inventions shall be void, except such as shall be granted under and by authority of the new Act, about to be submitted to Parliament.

That doubts having arisen respecting the persons to whom Patents ought to be granted, they having been heretofore confined, first, to the discoverer of a new thing; second, to the publisher of a new invention; and third, to the introducer of a foreign invention, proposed that in addition to the above class of persons, an inventor in England may communicate or sell his invention to any person in England, who shall be at liberty to take out a Patent here in his own name, and hold the same as his exclusive property under the same law that would secure it to the inventor himself.

That doubts having arisen respecting the subjects for which Patents ought to be granted, and the obvious impossibility of enumerating every subject, also as to the extent of the use of a thing which may prevent its being legally the subject of a Patent, it is proposed to enact, that, first, all new substances or things made; second, all new machines; third, all new additions or improvements of machines or things; fourth, all new combinations or arrangements of things already known; fifth, all methods or processes by which a newly discovered principle or ap-

plication is carried into practice by tangeable means; sixth, all chemical discoveries which result in or produce an article of commerce, shall be proper and legitimate subjects for Patent Right.

It is also to be provided that a Patent shall not become void because the article may have been used in some particular part of the United Kingdom in an imperfect manner, unless it has continued in public use to within ten years; and it is further to be provided, that any experiments which have been made by the Patentee; or on his behalf, shall not be deemed a public use of the invention.

That many Patents having been declared void, and great expense and loss of labour having arisen from the strict rules by which the Titles to Patents, and the Specifications of the Inventions have been construed, it is proposed that the court or judge before whom any proceedings at law may be taken upon any Patent for Inventions, shall have power to amend the Title or Specification in all matters of form or description which could not have misled a person acquainted with the subject, and that it shall be a question for the jury to decide whether any supposed omission in the description has been wilfully made; and if the jury find that it has not been wilful, then the Patent shall continue valid; but the Patentee shall be required immediately to enroll another Specification supplying that omission.

That the inventor may deposit a model of his machine, or a pattern of his invention, in some public buildings (to be agreed on,) and that the model may be produced in evidence in any Court of Justice. And it is also proposed, that if a Patent in which several things are included be bad as to part, it shall not be bad as to the whole; but the inventor shall be bound to enrol another Specification omitting the parts that are bad.

That the present mode of obtaining a Patent is most irksome and injurious to inventors; it is therefore proposed to enact, that the petition of the inventor shall be accompanied with a preparatory Specification describing the invention in general terms, which shall be sealed up and carried with the petition to the Office of Patents, where proper officers shall attend, who shall immediately carry the same to the office of the Attorney General or Solicitor General, who shall proceed thereon, without any reference back to the Secretary of State, and that the Attorney or Solicitor General shall direct the Letters Patent to be made out, without the forms of the Bill passing through the offices of the signet and privy seal, and without the sign manual of the King being required: and that the Lord Chancellor shall be authorized by the fiat of the Attorney General, or Solicitor General, to put the Great Seal to the Patent. And it is further to be enacted, that the Specification shall be enrolled as heretofore with drawings, but with a reference to the place where the model (if any,) is deposited.

It is proposed, that the Attorney or Solicitor General shall call in two Examiners to assist him.

That great abuses having sprung up from the liberty given of entering caveats in Chancery and the offices of the Attorney or Solicitor General, and many inventors having been injured by the secret of their inventions having transpired before the patent was granted, it is to be enacted that no more caveats, as at present, shall be entered at those offices; but that on a petition being presented for a Patent, the same shall be published in the next Gazette, in order to give notice to all parties who may be concerned, that they may come forward and enter their opposition to such Patent within seven days, and that the Attorney or Solicitor General do receive such opposition,

and consider the same before he issues his fiat to the Great Seal; and that the Letters Patent shall bear date from the day of presenting the petition, or from the report of the Attorney General.

That the costs and expenses of obtaining Letters Patent are unnecessarily increased when taken out for Scotland and Ireland, it is to be enacted that an inventor in England, upon lodging his petition at the Patent Office in London, shall be entitled to Patents for Scotland and Ireland, within a stated time, without further trouble or application, and that the like may be done in Edinburgh by persons in Scotland, and in Dublin by persons in Ireland.

That great doubts are entertained whether the amount of money paid for Patents, could with advantage to the public be lessened. (He proposes as is opinion, that for a 14 years patent half the present sum would be sufficient;) it is to be enacted that the sum of £—— shall be paid by the inventor at the time of depositing his petition, and the sum of £—— upon the receipt of the Letters Patent, and that it shall be the duty of some person in the Patent office to pay over to each person at present entitled to fees, a certain sum of money to be fixed on.

That improvements upon an existing Patent may be secured by paying a certain fee or stamp duty, and inrolling a Specification of the particular of the invention in its more matured form.

That the property in Letters Patent is unnecessarily abridged without any corresponding advantage to the public, and it is proposed to be enacted that the Letters Patent shall only be granted to one person, but that he shall be at liberty to assign his interest in any manner, and to any number of persons as he may think best to his own advantage.

That great delay, inconvenience, and expense have arisen in consequence of a patentee being often obliged to sue for an injunction in the Court of Chancery, whilst he has a suit defending in a Court of Common Law, it is therefore proposed to be enacted that every party to a suit in a Common Law Court, may by motion in that Court obtain an injunction or other redress, as an inspection of a machine, which would be allowed to him in a suit in a Court of Equity; and it is also to be enacted that the venue may be changed from Middlesex to the county in which the witnesses reside, at the discretion of the Court.

That the proper method of cancelling Letters Patent by writ of *scire facias* is very expensive, it is therefore proposed to be enacted, that after a verdict has been pronounced against a patent right, the party to the suit may apply to the Court in Bank, who shall have power to direct that the Letters Patent be cancelled; and that the writ of *scire facias* as to patents for inventions be accordingly abolished.

These are the features of Mr. Godson's Bill which has been presented to the House, but is not yet printed.

The Attorney General spoke at some length, and expressed his approbation of any suitable measure which might be proposed for giving greater security to Patent property, and also for obtaining Patents at a cheaper rate; but as he had not yet seen the Bill, he did not pledge himself to support all its clauses.

Mr. Lennard, Chairman of the former Committee on Patents, supported the introduction of the Bill, and pledged himself to give it his utmost attention. He considered that inconvenience might arise from granting Patents at too small a cost, but wished the subject to be referred to a Committee up stairs, where, (if we under-

stand him right) a Bill was already prepared for a similar object.

Mr. Warburton followed; expressing his opinion that the inconvenience and injury to which Patentees were at present subjected called loudly for correction, and urged that the Bill be sent to a Select Committee for revision, convinced that by so doing a very complete code might be produced, which should perfectly satisfy the House and the country.

Mr. O'Connell hoped that the measures of relief might be extended to his country, and that a Patent, whether granted in England, Ireland, or Scotland might extend over the whole of the United Kingdom.

It is intended that sufficient time shall be given to the members to consider the subject, and therefore the second desired is not to take place until the 24th April, the Act to go into force on the 1st November, as to the new mode of granting Patents, and for any legal proceeding as respects existing Patents, and imperfect Specifications to be retrospective.

There are, it will be perceived, some points in the proposed measure of great value, and fully calculated to answer the desired purpose; there are also others with which it is unnecessary to encumber the Bill—some that it would be highly improper to enact, and some that are utterly impracticable. It is, however, unnecessary, before the Bill is in the hands of the public, to give a decided opinion upon any of its clauses; it shall however have our best consideration and support as far as it may appear calculated to remedy existing evils. But we strongly recommend to those who are interested in this measure, instead of heaping letters of advice, or pamphlets, upon the table of the Hon. Gentleman, the projector of the Bill (and which his professional avocations render it impossible for him to

read) to call public meetings in their own localities, for the purpose of canvassing the several parts of the Bill, and eliciting the opinions of experienced Patentees, by which means, the Bill in an amended form, might be presented to the House in the shape of petitions, numerously signed from Manchester, Leeds, Birmingham, and other important manufacturing places, which would come with the character of much intelligence, and in so forcible a shape that Parliament could not resist the conviction, that in following the advice of such well informed and experienced petitioners, they must inevitably produce a code of laws, eminently calculated to protect the interests of the arts, the manufacturers and the commerce of the empire.

A M E R I C A N P A T E N T S.

For an improvement in the *manufacture of Gas for illuminating purposes*; Joseph Barton, city of New York.

Be it known, that I, Joseph Barton, have discovered a new and useful improvement in the manufacture of gas for illuminating purposes, and of a portable nature, and that the following articles are used as a combination to produce said gas without smell, viz.

Tallow, spirits of turpentine and rosin fused together, and decomposed through red hot tubes.

Turpentine and alcohol, do. do.

Coal tar and rosin, do. do.

Coal tar and tallow, do. do.

Coal tar, tallow, and rosin, do. do.

Seneca oil, coal tar, tallow, and rosin, do.

India rubber and Hydro carbons, do. do.

Oil of turpentine and rosin. do. do.

For a machine for *Felting and Napping Hats*; Thomas J. Cornell, Randolph county, Vermont.

The hat body is to be bowed, set up, and basoned in the usual manner; it is then to be rolled up in the sticking cloth, when it is ready to be operated upon by the machine, which consists principally of a vibrating rack, and a revolving apron. The machine is placed over the kettle, into which a pump passes, the piston of which is operated upon by a part of the machinery, and supplies the hot liquid necessary to the operations of felting or napping. The structure of the different parts, and the gearing employed, cannot be described without drawings. The claim is to "the method of felting and napping of hats by means of a vibrating rack and a revolving apron."

For an improvement in the *Manufacture and Setting of Porcelain Teeth*; Samuel Chamberlain, city of Philadelphia.

Pieces of platina wire are imbedded in the composition of which the tooth is made, previously to its being baked: these wires project from the top of the tooth, and to them the gold plate is to be soldered by which the tooth is to be attached. There are some other points which are considered improvements, as will be seen by the claim.

What I claim as new, and as my discoveries and inventions, are the glazing or enamelling the inside of the tooth and polishing the gold plate, so that no unpleasant roughness may be presented to the tongue, and the tooth may not absorb moisture from the mouth.

“ The manner of fixing the tooth by means of the pieces of platina and gold plate, and by soldering the spring that secures the tooth in the mouth to both the gold plate and the plug in the top of the tooth, which fixes the whole more firmly.

“ The method of securing the tooth differs from all others in this essential particular, that is, that there is no interstice between the plates, or between the plate and the tooth, for food or moisture to collect.”



New Patents

SEALED IN ENGLAND.

1833!

To John M'Curdy, of Southampton Row, in the county of Middlesex, Esq. for his invention of certain improvements in machinery, for acquiring power in rivers and currents, partly communicated by a foreigner.—Sealed 22d January—6 months for enrolment.

To Luke Hebert, of Paternoster Row, in the city of London, civil engineer, for his invention of certain improvements in machines or apparatus for, and in the process of manufacturing bread from grain, and the application of other products or another product thereof to certain useful purposes.—Sealed 24th January—6 months for enrolment.

To John Warner, the younger, of the Crescent, Jewin Street, in the city of London, brass founder, for his invention of certain improved processes in giving a metallic coating to various articles of commerce.—Sealed 24th January—6 months for enrolment.

To Robert Stephenson, of Newcastle-upon-Tyne, in the county of Northumberland, engineer, for his invention of certain improvements in the locomotive steam engines now in use, for the quick conveyance of passengers and goods upon edge railways.—Sealed January 26th—6 months for enrolment.

To William North, of Stangate Wharf, Lambeth, in the county of Surrey, slater, for his invention of an improvement in roofing or covering of houses or other buildings, or places.—Sealed 29th January—6 months for enrolment.

To John Samuel Dawes, of Badford Works, West Bromwich, in the county of Stafford, iron master, for certain improvements in the manufacture of iron.—Sealed 29th January—6 months for enrolment.

To Richard Butler, of Austin Friars, in the city of London, merchant, for his improvements in manufacturing, obtaining, or producing oil from certain substances; and in extracting, producing, or obtaining gas from the same or such like substances, or from the oil produced therefrom.—Sealed 29th January—6 months for enrolment.

To Edwin Appleby, of Doncaster, in the county of York, iron founder, for his invention of certain improvements in steam engines.—Sealed 29th January—6 months for enrolment.

To John Reehead, of Henry Street, Vauxhall, in the parish of Lambeth, in the county of Surrey, Esq. for his invention of certain improvements in the construction of coaches, waggons, or other carriages used for the transporting or conveying goods and passengers, to be drawn by horses, or propelled by steam, or other motive power.—Sealed 29th January—6 months for enrolment.

To John Linton, of Selby, in the county of York, brazier, for his invention of an improved construction of steam boilers.—Sealed 29th February—6 months for enrolment.

To Josiah John Guest, of Dowlais Iron Works, Merthyr Tydvil, in the county of Glamorgan, Esq. for an improvement in the process used for producing from iron ore, and other materials containing iron, what is called in the iron trade, finers.—Sealed 31st January—4 months for enrolment.

To James Lutton, of Dean Street, Soho, in the county of Middlesex, chair maker, for his invention of certain improvements in easy chairs.—Sealed 31st January—2 months for enrolment.

To Jonathan Dickson, and James Ikin, both of Holland Street, Blackfriars Road, in the county of Surrey, engineers, for their invention of improvements in the process of making gas from coal or other substances.—Sealed 6th February—6 months for enrolment.

To William Crofts, late of Lenton, but now of Radford, both in the county of Nottingham, mechanic, for his invention of certain improvements in certain machinery for manufacturing of bobbin net lace.—Sealed 11th February—6 months for enrolment.

To William Crofts, late of Lenton, but now of Radford, both in the county of Nottingham, mechanic, for his invention of an improved mode of combining together, and actuating certain parts of machinery already known and used for making lace, commonly called bobbin net.—Sealed 11th February—6 months for enrolment.

To Edward Lucas, of Edward Street, Birmingham, in the county of Warwick, engineer, for his invention of a self-acting force and lift pump.—Sealed 11th February—6 months for enrolment.

To James Brown, of Margaret Street, Commercial Road, in the county of Middlesex, rigger, for his invention of certain improvements in capstans, and apparatus to be used therewith.—Sealed 14th February—6 months for enrolment.

To William Rhodes, of the Grange, Leyton, in the county of Essex, brick maker, for his invention of an improved manufacture of bricks for building purposes.—Sealed 11th February—6 months for enrolment.

To Thomas Robinson Williams, Esq. late of Norfolk Street, Strand, for his invention of a new combination of fibrous materials, forming by means of machinery artificial skins, which may be applied for the purposes for which skins, leather, vellum, and parchment are now used.—Sealed 11th February—6 months for enrolment.

To Luke Hebert, of Hampstead Road, in the county of Middlesex, civil engineer, and James Don, of Lower James Street, Golden Square, in the city of Westminster, for their invention of certain improvements

in engines and other machinery employed in the construction of steam vessels and steam carriages, a portion of which improvements is applicable to other purposes, part of which improvement was communicated by a foreigner.—Sealed 21st February—6 months for enrolment.

To Thomas Hills, the younger, of Saint Michael's Alley, Cornhill, in the city of London, gentleman, for his invention of certain improvements in furnaces for steam boilers, and other useful purposes.—Sealed 21st February—6 months for enrolment.

To Alexander Gordon, of the Strand, in the county of Middlesex, engineer, for certain improvements in the boilers or generators of steam or vapour, and in condensing such steam or vapour, and in engines to be worked by steam or vapour, for propelling or actuating machinery and carriages on land, and boats or vessels, or other floating bodies on water, being a communication made to him by a certain foreigner.—Sealed 21st Feb.—6 months for enrolment.

To Robert Hicks, of Wimpole Street, in the county of Middlesex, Esq. for his invention of an improved method of, and apparatus for, baking bread.—Sealed 21st February—6 months for enrolment.

To John Thompson, late of the London Iron and Steel Works, Parade, Thames' Bank, near Chelsea, in the county of Middlesex, but now of Newhall Street, Birmingham, in the county of Warwick, Esq. for his invention of improvements in the steam engine.—Sealed 28th February—6 months for enrolment.

CELESTIAL PHENOMENA, FOR MARCH, 1833.

D.	H.	M.		D.	H.	M.	
1	0	0	☾ rises 6 h. 48 m. sets 5 h. 38 m.	16	22	0	☾ in Apogee.
—	—	—	☾ rises 11 h. 51 m. A. M. sets 3 h. 22 m. A. M.	18	0	0	Mer R. A. 0 h. 43 m. dec. 5. 19. N.
5	0	0	☾ pass mer. 11 h. 55 m.	—	—	—	Venus R. A. 2 h. 39 m. dec. 19. 16. N.
—	—	—	Clock before the ☉ 11 m. 45 s.	—	—	—	Mars R. A. 5 h. 12 m. dec. 24. 57. N.
5	16	46	Ecliptic opposition or ☉ full moon.	—	—	—	Jupiter R. A. 0 h. 32 m. dec. 2. 17. N.
6	0	0	Mer. R. A. 23 h. 21 m. dec. 5. 41. S.	—	—	—	Saturn R. A. 11 h. 44 m. dec. 4. 28. N.
—	—	—	Ven. R. A. 1 h. 56 m. dec. 14. 27. N.	—	—	—	Georg. R. A. 21 h. 33 m. dec. 15. 15. S.
—	—	—	Mars R. A. 4 h. 46 m. dec. 24. 43. N.	—	—	—	Vesta R. A. 18 h. 26 m. dec. 19. 6. S.
—	—	—	Jup. R. A. 0 h. 22 m. dec. 1. 9. N.	—	—	—	Juno R. A. 15 h. 38 m. dec. 6. 54. S.
—	—	—	Sat. R. A. 11 h. 47 m. dec. 4. 5. N.	—	—	—	Pallas R. A. 1 h. 39 m. dec. 7. 23. S.
—	—	—	Georg. R. A. 21 h. 31 m. dec. 15. 27. S.	—	—	—	Ceres R. A. 3 h. 14 m. dec. 15. 55. N.
—	—	—	Vesta R. A. 18 h. 6 m. dec. 19. 6. S.	19	12	0	☽ in perihelio.
—	—	—	Juno R. A. 15 h. 37 m. dec. 7. 52. S.	20	0	0	☉ rises 6 h. 5 m. sets 6 h. 11 m.
—	—	—	Pallas R. A. 1 h. 13 m. dec. 8. 39. S.	—	—	—	☾ rises 6 h. 0 m. A. M. sets 5 h. 3 m. P. M.
—	—	—	Ceres R. A. 2 h. 59 m. dec. 14. 18. N.	—	—	—	Clock before the ☉ 7 m. 39 s.
6	0	0	Venus elong. max. E. 46. 19.	20	8	6	☽ enters Aries.
6	8	43	☾ in conj. with ♄ long. 25. 25. Virg. ☾ lat. 4. 30. N. ♄ lat. 2. 27. S. diff. of lat. 2. 3.	20	23	0	Ecliptic conj. or ☉ new moon.
8	0	0	Remarkably high tide may be expected about this time, if not impeded by wind.	21	17	30	☾ in conj. with ♄ long. 9. Aries. ☾ lat. 4. 53. S. Jupiter lat. 1. 6. S. diff. of lat. 3. 47.
10	0	0	☉ rises 6 h. 28 m. sets 5 h. 54 m.	22	11	20	☾ in conj. with ♄ long. 18. 43. Aries. ☾ lat. 5. 1. S. ☽ lat. 1. 26. N. diff. of lat. 6. 27.
—	—	—	☾ rises 11 h. 33 m. p. m. sets 8 h. 42 m. A. M.	24	19	20	☾ in conj. with ♄ long. 18. 35. Taur. ☾ lat. 4. 26. S. ☽ lat. 4. 5. N. diff. lat. 8. 31.
—	—	—	☾ passes mer. 16 h. 15 m.	25	0	0	☉ rises 5 h. 54 m. sets 6 h. 19 m.
—	—	—	Clock before the ☉ 10 m. 30 s.	—	—	—	☾ rises 7 h. 57 m. A. M. sets 10 h. 53 m. P. M.
11	13	0	Venus in perihelio.	—	—	—	☾ pass mer. 3 h. 12 m.
12	17	47	☾ in ☐ or last quarter.	—	—	—	Clock before the ☉ 6 m. 7 sec.
14	22	0	☽ in north node.	28	10	44	☾ in ☐ or first quarter.
15	0	0	☾ rises 6 h. 17 m. sets 6 h. 3 m.	28	0	0	☽ elong. max. 18. 66.
—	—	—	☾ rises 3 h. 41 m. A. M. sets 11 h. 49 m. A. M.	30	0	0	☉ rises 5 h. 42 m. sets 6 h. 28 m.
—	—	—	☾ passes the meridian 20 h. 24 m.	—	—	—	☾ rises 11 h. 46 m. A. M. sets 8 h. 13 m. A. M.
—	—	—	Clock before the ☉ 9 m. 8 s.	—	—	—	☾ pass mer. 7 h. 52 m.
—	—	—	☉ and ♄ in opposition.	—	—	—	Clock before the ☉ 4 m. 35 s.
16	2	0	☽ in conj. with ♄ long. 8 20. Aries, ☽ lat. 12. N. ♄ lat. 1. 6. S. diff. of lat. 1. 18.	31	0	0	☽ in perihelio.
							Eclipses of Jupiter's Satellites are not visible this month.

J. LEWTHWAITE Rotherhithe.

METEOROLOGICAL JOURNAL,
FOR JANUARY AND FEBRUARY, 1833.

1833.	Thermo.		Barometer.		Rain in in- ches.	1833.	Thermo.		Barometer.		Rain in in- ches.
	Hig.	Low	Hig.	Low			Hig.	Low	Hig.	Low	
Jan.						Feb.					
26	41	27	30,08	30,01		11	53	40	29,33	29,24	,275
27	39	25	29,98	29,92		12	52	38	29,56	29,41	,225
28	44	31	29,87	29,75		13	49	39	29,30	29,24	,25
29	40	33	29,46	29,34	,05	14	48	38	29,21	29,14	,125
30	39	33	29,62	29,48	,075	15	44	32	29,29	29,06	,625
31	36	25	29,68	29,46	,125	16	43	28	29,41	29,31	
Feb.						17	45	29	29,66	29,51	
1	37	27	29,56	29,34	,05	18	48	34	29,56	29,46	,125
2	47	28	29,46	29,30	,35	19	47	35	29,81	29,72	
3	47	35	29,55	29,44	,2	20	43	33	29,49	29,13	,275
4	53	35	29,78	29,60	,05	21	47	35	29,77	29,64	,4
5	52	45	29,84	29,79	,025	22	45	39	29,94	29,81	,1
6	53	40	29,94	29,93		23	44	30	29,84	29,71	
7	53	40	29,82	29,72	,05	24	43	29	29,67	29,58	,05
8	52	41	29,71	Staty.		25	43	29	29,42	Staty.	,1
9	47	39	29,66	29,56	,5						
10	49	37	29,21	29,20	,275						

Edmonton.

CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.

Longitude 3 51 West of Greenwich.

To GEORGE HENRY MANTON, of Dover-street, Piccadilly, in the county of Middlesex, gun maker, for his invention of an improvement in the construction of locks for all kinds of fowling pieces and fire arms.—
 [Sealed 2d September, 1829.]

THIS improvement applies solely to guns and pistols which are to be fired upon the detonating principle, the object being a means of allowing the fulminating powder to escape readily from the touch hole when exploding ; as it has been found that by the employment of detonating primings, the force of the fulminating powder in the touch hole not being allowed to escape readily, has caused the piece to kick.

The Patentee proposes to remedy this inconvenience by opening the side of the touch hole at the same instant that the cock strikes the nipple, which will allow the fulminating powder to blow out.

Plate VI. figs. 12 and 13, show the side of a fowling piece, with a lock for firing by percussion ; *a*, is the cock ; *b*, the nipple upon which the detonating cap is to be placed ; *c*, and *d*, is a double armed lever turning upon a pin in the bridge piece *e*.

A flat disc at the end *c*, of the lever, covers a lateral opening in the side of the touch hole, as seen at fig. 12, and thus keeps the touch hole closed and protected from the intrusion of wet to the priming. At the other end *d*, of the lever, there is a small friction roller, which bears against the edge of the cock, the lever being kept up to its bearing by a small spring.

On discharging the fowling piece, the descent of the cock forces the lever into the position shown at fig. 13, which shifts the disc *c*, from the aperture of the touch

hole, and allows the ignited priming to blow away without causing the gun to recoil.

The Patentee says that the opening and closing of a lateral aperture from the touch hole may be effected in several other ways beside that which he has shown, and he therefore claims the exclusive right to every mode of letting off or relieving the exploded priming from the touch hole at the time that the piece is discharged.—
[Inrolled in the Inrolment Office, November, 1829.]

To THOMAS ROBINSON WILLIAMS, of Norfolk-street, Strand, in the county of Middlesex, Esq. for his having invented improvements in the making or manufacturing of felt, or a substance in the nature thereof, applicable to covering the bottoms of vessels, and other purposes.—[Sealed 23d May, 1829.]

In sheathing the bottoms of ships it was found desirable to place between the wood work and the copper plates, sheets of brown paper steeped in tar, for the purpose of protecting the wood work from the anger worm; latterly sheets of felted wool, steeped in tar, have been employed for the same purpose, and the object of this Patent is to prepare such sheets of felt by means of machinery.

Plate VI. fig. 14, represents the section of an apparatus to be employed for this purpose; *a*, is a vat or vessel containing tar; *b, b*, are two cylindrical rollers mounted in suitable bearings, over which rollers an endless web of wire gauze is passed. This web is conducted also over two guide rollers above the tar in the vat, and beneath a roller *d*, immersed in the tar; *c, c*, are two similar cylin-

dricall rollers carrying another endless web of wire gauze, which passes under a weighted guide roller *e*, and also under the roller *d*, in the vat.

The loose wool which should be first prepared by carding, is to be spread out evenly of a sufficient thickness upon the inclined surface of the wire gauze, between the two front rollers *b*, and *c*, and the rollers being then made to revolve, the thickness of wool is drawn in by the two webs between the front rollers *b*, *c*, and is thence conducted down into the vat, where it becomes saturated with the tar, and being further carried between the two webs, it passes upwards beneath the pressing roller *e*, which gives it firmness, and is then led off and discharged from the webs in a stiff sheet on to the table *g*, where it may be cut into suitable sized pieces. After this the pieces are hung up to dry, and are then fit to be used for covering the bottoms of ships to protect the wood work.—
[Inrolled in the Inrolment Office, November, 1829.]

To EDWARD HANCORNE, of Skinner-street, in the city of London, nail manufacturer, in consequence of a communication made to him by a foreigner residing abroad, for an invention of certain improvements in making nails.—[Sealed 16th October, 1828.]

THIS is a machine for manufacturing nails by cutting, pressing, and stamping rods, or slender bars of iron.

The rods or bars having been prepared either by rolling or hammering, or by cutting them from sheets or plates of iron, called slitting, are then to be made red hot, and in that state passed through the machine to be cut into suitable lengths,—pressed into wedge forms for

pointing, and stamped at the end to produce the head. A longitudinal view of the machine is shown in Plate VII. at fig. 1 ; but, as it is very complicated in its details, and its principles appear to have been previously embodied in the machinery for making nails, patented by Mr. Thomas Tyndell, of Birmingham, in 1827 (see London Journal of Arts, Second Series, Vol. III. page 184), we do not consider it necessary to describe all its minutia, as the general operations of the machine may be very well understood from this figure.

A strong iron frame work, one side of which is shown at *a, a*, supports the whole of the mechanism ; *b*, is a table capable of sliding to and fro. Upon this table lying horizontally are the clamps, which take hold of the sides of the rod as it advances, and also the shears which cut the rod into short lengths, suitable for making from each length a separate nail.

These clamps or holders consist of a fixed piece and a movable piece, the latter being brought into action by a lever. The shears or cutters are situate and perform much in the same way.

The rod or bar of iron shown at *c*, having been heated to a red heat, is passed into the machine by sliding it forward upon the table *b*, when the table is in its most advanced situation ; rotary motion is then given to the crank shaft *d*, by means of a band passed round the rigger *e*, which causes the table *b*, to be drawn back by the crank rod *f* ; and as the table recedes the horizontal lever is acted upon, which closes the clamps. By these means the clamps take fast hold of the sides of the heated rod and draw it forward, when the movable chap of the shears, also acted upon by a lever, slides laterally, and cuts off the end of the rod held by the clamps : the piece thus separated being intended to constitute one nail.

Let it be supposed that the nail situate at *g*, having been thus brought into the machine and cut off, is held between clamps, pressing it sideways, but which are not seen in the figure: in this situation it is about to be headed and pointed.—The header is a steel die *h*, intended to be pressed up against the end of the nail by a cam *i*, upon the crank shaft, which cam at this period of the operation acts against the end of a rod *k*, forming a continuation of the die *h*, and forces up the die so as to compress the solid metal into the form of a head.

The process of pointing the nail is performed by two rolling snail pieces *l*, *l*. These snail pieces are something broader than the width of the nail, and turn upon axles supported in the side framing. As the table *b*, advances, racks *m*, on the edge of the table take into toothed segments *n*, *n*, on the axles of the snails, and cause them to turn.

The snails at first pinch the nail close under its head with very little force, but as they turn over the longer radius of the snail coming into operation upon the nail, its substance is then very considerably pressed, and forced into a wedge form. This completes the nail, and it is immediately discharged from the clamps or holders; the carriage is then sent forward again by the rotation of the crank shaft, and another portion of the rod *c*, is brought forward, cut off, and formed to the desired shape of a nail, in the way above described.—[*Inrolled in the Inrollment Office, April, 1829.*]

To EDWARD DAKIN PHILP, of Regent-street, Saint James's, in the city of Westminster, and county of Middlesex, chemist, for his having invented an improved distilling and rectifying apparatus.—[Sealed 29th November, 1828.]

THIS is an apparatus to be placed upon a still head, for the purpose of separating the aqueous from the alcoholic vapours, which it professes to do with better effect than has been accomplished by any other contrivance heretofore employed.

Plate VII, fig. 2, exhibits the external appearance of the apparatus placed upon a still; fig. 3, shows its internal arrangement in section upon a larger scale; *a*, is the head of the still, from which a cylindrical tube *b*, *b*, *b*, rises as a head. This tube is divided into several compartments *c*, *c*, *c*, *c*, (four are proposed) by horizontal partitions *d*, *d*, *d*, *d*, *d*. All communications from one compartment to the next is cut off by these partitions, except through the apertures *e*, *e*, *e*, *e*, *e*, and these are guarded by water joints.

Within the compartments *c*, inner chambers are formed by inverted cylindrical boxes *f*, *f*, *f*, *f*, and the vapour emitted from the still, after entering the lower compartment *c*, passes from thence into the interior of the box *f*, by apertures at the lower parts of the inverted box, or the boxes may stand within the compartments upon legs, the object being to make the way free for the flow of the vapour from the lower part of each compartment into the inverted box within it.

Each compartment is circumscribed by a cylindrical vessel *g*, *g*, containing water for the purpose of refrigerating the vapour, and promoting its condensation, and

the water is supplied to the upper vessel by a pipe *h*, from whence it flows into the lower vessels by other pipes *i*, *i*, *i*, and is discharged ultimately at *k*.

The construction of the apparatus having been described, we proceed to explain the mode of its operation:—The vapour rising from the still passes, through the lower aperture *e*, in the head *b*, into the lower compartment *c*, as shown by the arrows. In this compartment the vapour becomes partially cooled by the surrounding vessels of water, and its aqueous parts become condensed, which fall to the bottom of the compartment, and flow away into the still again by the descending pipe *l*, while the alcoholic vapour rises through the apertures *m*, *m*, at bottom into the box *f*, *f*, and thence proceeds from the box *f*, up the tube *e*, as shown by the arrows into the second compartment *c*. Then the vapour becomes again cooled by the surrounding vessel of cold water, and is further condensed, the aqueous part falling to the bottom of the compartment, and flowing away through the water joint to the lower compartment, and the alcoholic vapour rising as before through the aperture *e*, to the next compartment and so on, until it reaches the top of the still head, whence it proceeds in a highly rectified state by the pipe *n*, to the worm tub, or ultimate refrigerator, where the alcoholic vapour becomes condensed into a pure spirituous liquor.

The Patentee does not confine himself to any particular dimensions or number of compartments, boxes, and vessels *c*, *f*, and *g*, nor does he define the precise features of his invention, but states that he does not claim any of the parts of the apparatus which may have been so employed before.

After his indefinite claim, we feel ourselves bound to refer our readers to the patented inventions of Mr. Saint-

mare, applicable to distilling apparatus, (see the first Series of the London Journal of Arts Vol. X. page 77. and Vol. XIII. page 198,) in which the more perfect condensation of the vapour emitted from a still, is sought to be effected by passing it through a succession of chambers in connection with refrigerating liquor, until the vapour is discharged at top in a highly concentrated state; also, the flow of water through the surrounding vessels *g, g,* by which the coldest medium is applied to the most highly concentrated portions of the vapour, is an adaptation of the same principles as those claimed under Yandal's Patent, refrigeration, (see also Vol. XIII. page 95.)—[*Inrolled in the Inrolment Office, May, 1829.*]

To JOHN FORBES, of Cheltenham, in the county of Gloucester, architect and surveyor, for his new invented method of burning or consuming smoke.—
[Sealed 15th December, 1828.]

THE principle feature of this invention is placing one fire grate immediately under another, by which the smoke emitted from the lower fire will pass up through, and be consumed by the upper fire.

The object of the invention, we presume, is to cure smokey chimnies, but upon what principle the additional fire is to effect this, we do not perceive.

Plate VII, fig. 4, is a section of the fire place and chimneys; *a*, is the upper or ordinary grate; *b*, is the lower grate. The smoke and combustible vapours from the fire of the lower grate *b*, is intended to pass through the fire of the upper grate *a*. A blower *c*, is made to

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To JOHN OSBORNE MOSLEY and GEORGE BELL, both of Primrose-hill, Salisbury-square, in the parish of Saint Brides, in the city of London, die-sinkers and embossers, copartners, for their invention or improvement in the making or manufacturing of pill or other boxes from pasteboard, paper, or other materials, which improvements are applicable to other purposes.—[Sealed September 8th, 1832.]

THESE improvements in the making or manufacturing of pill and other boxes from pasteboard, paper, or other mate-

rials, consist in forming the boxes, and also their lids, by means of dies in cutting and stamping presses, by the employment of which presses and dies, pieces of cardboard, or thick paper, are first cut out to the desired shapes, and afterwards are bent up and pressed into the forms of boxes and lids of boxes.

The dies are of two kinds: first, the cutting dies for forming the pieces of card or paper of which the boxes are to be constructed; secondly, the stamping dies for shaping the pieces, and bringing them together into the proper forms.

The cutting dies must be made according to the shapes and dimensions of the intended boxes. Suppose a circular box is required to be made of about one inch in diameter, and five-eighths of an inch deep, we first cut out a piece of thick paper or card, the form of which may be described as an octagon, of about one inch and seven-eighths across, with acute notches cut out at its angles; from this piece the bottom and cylindrical part of the box is to be made, by placing it in a stamping press between suitable dies, and forcing up its edges first into a cup shape. A cylindrical hoop of thick paper or card of about three quarters of an inch wide, and of the same diameter as the interior of the intended box, is then provided, either by winding a strip of pasted paper round a stick, or by any other convenient means, which hoop is to be placed within the previously formed cup as a lining, and must be attached to it by paste, or other adhesive matter.

After this the cup and lining are placed in a stamping press between other dies, and being made to adhere firmly, form a cylindrical box with a ledge, against which the edge of the lid is to fit; thus producing the bottom and straight sides of the box in one piece. The lid of this box is to be made from a circular disc of thick paper or card, of about

one inch and three-eighths diameter, which is to be in like manner pressed by dies, first into a dish form, and ultimately to a true cylindrical figure, fitting exactly on to the top of the box. The lid of the box being shallow, the angular notches are not required to be cut out of the disc of paper.

In varying the sizes of the boxes to be made by these means, the octagons and discs of paper or card must be varied, and also the dies employed for cutting and forming the boxes; the Patentees do not intend to confine themselves to any particular shapes or dimensions. For the purpose of rendering their improvements better understood, the Patentees have subjoined to their specification in a sheet of drawing representations, several figures of the parts of a box, cut out and detached, and also combined upon this principle; and likewise various views of the tools employed in their manufacture, which will also be found in the several figures in Plate VI.

Fig. 1, is a front elevation of an ordinary fly press, which is used for performing all the various operations of cutting and pressing in the different stages of this improved manufacture of pill and other boxes; *a*, is the part containing the upper die; *b*, is the bed containing the counter die, which in some instances is made moveable in the bed. And as it is necessary in some parts of the process to raise the counter die with the portion of the box under operation from out of the bed, after the stamping or pressing has been performed, a strong spring *c*, is attached under the press, and connected to the bench, upon which the press is fixed by screw staples *d, d*, which allow of the spring being adjusted. The centre part of this spring presses upwards against the tail piece or piston *e*, of a moveable counter die, and raises it after it has been depressed by the upper die; but the Patentees state that they do not mean or

intend to confine themselves to the use of this spring, as a weighted lever or other construction of spring would answer the purpose equally well, and proceed to describe their invention as follows:—"In our improved manufacture of pill and other boxes, we employ a number or series of these kind of presses, placed on benches round the work-room, each press containing a pair of the proper shaped tools or dies to cut out and form the different parts of the boxes, and the presses are stationed in such order that the work performed by the first press may be handed to the next, and so on throughout the whole process of manufacture—thus keeping a very considerable number of boxes in progress at one time. But it will be evident that a machine or apparatus might be constructed which would perform all the various operations of our different presses, such machinery or apparatus being made to contain a number or series of the cutting and stamping dies, worked by levers or other means, and having a feeding apparatus to convey the material or parts of the box under operation from one pair of dies to the next, and so on. It is therefore to be understood, that the subject of our invention, or that which we claim as new in the manufacture of pill and other boxes, is the process of making them from sheets of cardboard, thick paper, or other materials, by means of cutting, pressing, or stamping dies, as described, without reference to any particular construction of machinery by which the said dies may be put into operation.

"The shape of the piece of cardboard or paper, used in the first instance, to form the bottom and sides of the box, as described, is represented in the accompanying drawing at *A*.

"These shapes or pieces are cut out of a flat sheet of cardboard or paper by the pair of dies *a*, and *b*, shown in plan views at fig. 2; *a*, is the upper or cutting die, and *b*, the

counter die or bed. The sheet of cardboard or paper is placed between them, as shown in fig. 3, in which *b*, is a vertical section, taken through the middle of the counter die or bed, with the sheet of cardboard or paper lying upon it, and above it is the cutting die. The upper die or cutter *a*, descends by the ordinary action of the press, and after punching or cutting out each shape or piece of cardboard or paper *A*, forces it down through the counter die *b*, and it falls into a box or receptacle below.

“ These pieces *A*, are then forwarded to the second press, where they are severally brought into the cup shape, shown in plan and side representations at *B*; this is effected by the punch and counter die, shown at fig. 4, which is a section of the counter die and bed *c*, the punch *d*, being placed over it. The shapes or pieces *A*, are severally placed in the circular recess *e, e*, in the counter die or bed, (as shown at fig. 4,) and on the descent of the punch *d*, the piece *A*, will be passed through the counter die *c*, and its edges bent up into the shape *B*. The box being intended to have a shoulder for the edge of the lid to fit against, there must be a lining placed within it as described, the lid being made to fit upon the lining so that the edges of the piece *B*, may form the ledge.

“ This lining may be produced by taking a long strip of pasted paper, as shown at *c*, and winding it round a stick or roller. Fig. 5, is a plan view of a small apparatus used to form the lining. The roller *f*, is placed upon the end of the shaft *g*, turning in bearings in the standards *h, h*, and has a small winch handle *i*, on its reverse end, by which it is turned round, and the strip of paper being wound upon it, a cylindrical hoop is produced, as shown in several views at *n*. But these cylindrical hoops or linings may be made by other means; for instance, a long cylindrical tube of the proper

diameter may be formed out of paper or cardboard, and the linings cut off from this tube to the required length.

“ The paper hoops *n*, after being dried, are put upon the end of the tool or handle *k*, fig. 6, to be pasted, part of the hoop being shielded or covered by the guard-ring *l*, as shown more evidently in the section of the tool fig. 7. Paste, or other adhesive matter, being now put upon the outside of the hoop in order to stick it to the interior of the box, it is in that state placed within one of the pieces *b*, which has been previously placed over one of the holes *m*, made in the drying board, particularly shown at fig. 8, and in section at fig. 9. These holes *m*, in the drying board are bevelled, or made conical upon the upper edge; and on pressing the tool *k*, with the hoop *n*, and part *b*, downwards, the inclined sides of the holes in the board will close the sides of the piece *b*, and the lining *n*, and confine them in the drying board, as shown in fig. 9, and on drawing out the tool *k*, they will be left in the board, as represented at *n, n*, in figs. 8 and 9, where they will remain until they are dry enough for the next operation, and will be of the shape represented in the side view *e*, which may now be called a box, though not finished.

“ The next operation to be effected, is that of finishing the shape of the box, and pressing the top edge of the lining and the ledge parallel with the bottom of the box at the same time, to emboss the name of the maker, or any device upon the bottom.

“ This is effected by the punch and counter die, shown at figs. 10 and 11, in which the bed *o*, is shown in section, and the pair of dies as seen on their sides. The upper part of the counter die exactly fits the interior of the box, the edge of the lining resting upon its ledge *q, q*. There is also a ledge *r, r*, within the bed, against which the ledge of the box is pressed by the upper die *s*. This die may

have upon it, any device desired to be embossed upon the bottom of the box; the outside diameter of the box exactly fits the inside of the bed. The counter die *p*, being raised out of the bed *o*, as shown in fig. 11, by the spring or other means, one of the boxes *E*, is placed bottom upwards upon it, the edge of the lining resting upon the ledge *q*; the upper die then descends, and forces down the counter die until the ledge of the box meets the ledge *r, r*, within the bed, when a sufficient pressure is given to emboss the name or device upon the bottom of the box, and form it truly cylindrical and perfect, as represented in a side view at *F*. The box will then be ready to be covered with any coloured paper or outer covering, by hand if desired.

“ The piece of paper or cardboard used to form the lid of the box is a perfect disc, as shown at *G*, and may be cut out of the sheet by a common hollow punch, or a solid punch and hollow counter die. The latter we prefer, as it forms a more perfect edge to the disc.

“ The pieces *G*, are placed into the circular recess *t*, of the bed *u*, (see figs. 12 and 13), which are section figures taken through the bed, but showing the upper die *v*, and counter die *w*, as seen on their sides. Fig. 12, shows the dies apart, and the disc of paper or cardboard placed in the counter-sunk recess in the bed. On the die *v*, descending, the disc is held fast between the dies, and as they continue to descend, the inclined or conical part *x*, of the bed, causes the edges of the disc to be turned up, and come in contact with the lower part of the upper die, which is just as much smaller than the lower or cylindrical part of the bed as the cardboard or paper is thick. There is a small cutting edge at ledge *y, y*, upon the upper die, which, when it comes in contact with the cylindrical part of the bed, cuts off any little superfluous matter from the disc, should it

happen that it has not been placed in the recess quite central with the dies. The dies descend with the lid of the box until the shoulder or bottom of the counter die comes against the bottom of the cylindrical part of the bed, as shown in fig. 13, when the box lid receives sufficient pressure to cause it to retain its proper cup shape, as represented in the different views at *h*. The counter die being raised up out of the bed, the piece *h*, is removed and forwarded to another pair of dies, where it receives its last compression, and if required, the name of the chemist who uses the pill boxes, or any other device may be embossed upon it. Fig. 14 shows a pair of dies and bed, the counter die having a smaller diameter fitting the interior of the box lid; the upper die carrying the device to be embossed upon the top of the lid. The cup shaped piece *h*, or lid, is placed upon the smaller diameter of the counter die, and on the upper die descending, the counter die and the lid are forced down into the cylindrical part of the bed, and there receive sufficient pressure to form them perfectly cylindrical, and cause them to retain their proper shape, as shown at *i*, when they will be ready to have a slip of coloured paper pasted round it to match the box, as shown at *k*, which is a perspective representation of one of our improved pill boxes when finished.

“ When pill boxes are not required to have a shoulder for the lid to fit against, then the lining, if used at all, need not extend above the top of the box, the side of the box being made somewhat deeper; in this case the ledge *q*, of the counter die *p*, (see figs. 10 and 11,) may be dispensed with; but the lining in some cases may not be thought necessary, as the outside covering may be found sufficient to strengthen the sides of the box; and under these circumstances we prefer making the outside covering in a cylindrical hoop, formed in the same manner as the linings

above described, the piece B, being placed withinside of the hoop instead of the outside.

“ Having now particularly described and ascertained the nature of our improvements in the manufacture of pill and other boxes, it only remains for us to state, that the same improvements are applicable to the process or manufacture of various other useful articles ; for instance, we make or construct caps or coverings for vials, or other bottles, by the same description of cutting and pressing dies, and emboss the name of the chemist or perfumer (who uses such bottles) upon the top part of the cap. Fig. 15, is a perspective representation of one of these improved coverings or caps, and fig. 16, is a representation of a part of a vial with one of them affixed.”—[*Inrolled in the Rolls Chapel Office, March, 1833.*]

Specification drawn by Messrs Newton and Berry.

To CLAUDE MARIE SAVOYE, of Oxford-street, in the county of Middlesex, merchant, in consequence of a communication from a foreigner residing abroad, for an improvement or improvements in mills or machines for grinding or reducing grain and other substances —
[Sealed 15th December, 1831.]

THESE improvements in mills or machines for grinding or reducing grain and other substances consist, first, in a peculiar modification of the parts which constitute the rubbing or grinding surfaces ; secondly, in giving to the said rubbing or grinding surfaces an alternating circular motion ; thirdly, in surrounding the said mills or machines with water or other fluid at a low temperature, to abstract

and carry off the heat generated by the friction of the machinery, and the substances operated upon.

Having thus stated in what the aforesaid improvements consist, the Patentee proceeds particularly to describe and ascertain in what manner the same are to be performed in the following manner, reference being had to the several figures of this invention in Plate VII. The invention in its simplest form consists of two principal parts, as delineated in perspective by figures 11 and 12. Fig. 11, is a circular piece or ring of cast iron or other suitable material, which is made fast in a horizontal position to a strong frame of wood or metal, by means of ears or lugs, two of which are brought into view at *a, a*. The exterior side of this ring is perpendicular, but the interior is inclined or sloping, where it is furnished with a series of inclined teeth *b, b*; these teeth project beyond the smooth surface about a twelfth of an inch at their upper ends, but gradually diminish in their projections or thickness downwards, until they arrive at the smooth surface (or as workmen express themselves, terminate at nothing), but just previous to their arrival at this point they are met by a series of small grooves or gutters *c, c*, which are intended for the passage of the bran or other parts of the ground materials, as well as to permit the transmission of currents of air through them.

Fig. 12, represents a perspective view of the inner ring or moving wheel, made of similar materials to fig. 11, and provided externally with a circle of similarly formed teeth, (marked also *b, b*, and *c, c*,) except that they are inclined in the reverse direction, for the purpose of producing, by their opposite position, a clipping or scissors like action. This inner ring is also made a little inclined or conical externally, so as to fit concentrically within the circle of fig. 11, and bring their respective teeth either to touch or

approach each other at uniform distances apart throughout the circle or annular space formed between them.

For the clearer explanation of this arrangement, a plan of the two toothed rings (delineated at figs. 11 and 12,) is given by fig. 13, in which the parts are reduced, *d, d*, representing the outer ring, and *e, e, e*, the inner ring; between these are represented three concentric circular lines, respectively marked *f, g, h*; the space from *f*, to *g*, denotes the thickness of the upper extremities of the teeth of the outer toothed ring, and the space from *g*, to *h*, the thickness of the upper extremities of the teeth of the inner ring, while the breadth of the middle line *g*, may be considered to indicate the space through which the flour or reduced substances pass out of the mill. In this figure the ears or lugs *a, a, a*, are shown, with holes made through them, for the purpose of fastening them by screw bolts to the framing *i, i, i*; *j*, is a central spindle fixed to the inner ring *e*, upon which it turns. The motion imparted to this wheel is not rotative, but alternating through only a portion of its circumference, by the action of a vibrating rod *k*, which will be better explained in connexion with the figures hereinafter described.

Fig. 14, exhibits a vertical section of the principal parts of the mill; *a*, shows one of the lugs or ears; *d, d*, the outer toothed circle; *e, e*, the inner, and between them on either side, the three lines diverging to a point, represent the teeth. The interior circle *e*, is covered with a conical cap of sheet iron *l*, and the outer circle *d*, by a cylindrical open topped hopper *v*, the space between this hopper and that cap being appropriated to the reception of the corn or other substances to be ground. The alternating motion given to the inner toothed circle *e*, is thus effected; a lever *m, n*, is fastened by a nut and screw to one of the arms of

the inner wheel *e*, and also to the axis *j*, which constitutes the fulcrum of the lever. The other end of this lever passes through the framing, and is attached to the extremity of the rod *k*, which is made to vibrate by the revolution of a crank *o*, actuated by any convenient power, as shown in fig. 15.

As the weight of the inner circle *e*, would cause it to come in contact, and press upon the outer, if unsupported by other means, the following arrangement is adopted, by which it is supported, and the required space between the grinding surfaces is at the same time adjusted. The spindle *j*, turns in a socket *p*, fixed to the framing, its extremity resting on a bolt *q*, that passes loosely through a hole in the framing, and the end of the bolt is supported upon the extremity of a lever *r*, which has its fulcrum at *s*, and is acted upon at *t*, by a screw as represented, the turning of which screw causes the inner grinding circle *e*, to be elevated or depressed, and thereby removed farther from or nearer to, the outer grinding circle, thus adopting them to grind coarse or fine at pleasure. When the material to be ground is so hard as to create such a resistance to the action of the mill as to cause the inner ring *e*, to rise up, and thereby allow the materials to pass unground, or insufficiently reduced out of the mill, a screw stop, represented at *u*, is put into requisition; this screw stop passes through a tap in the socket *p*, and enters a groove formed in the spindle *j*, thereby preventing the spindle and the circle *e*, from rising up beyond its assigned limits, which may be easily adjusted by such obvious adaptations as not to need particularising.

“ Having described the separate parts and uses of the aforesaid machine, the Patentee proceeds to describe its action generally with reference to fig. 15, which on a still farther reduced scale exhibits a side elevation of the whole machine ;

w, is a winch, which being fixed on the axis of the fly wheel *x*, and the crank *o*, communicates motion to them, and through the medium of the latter actuates the vibrating rod *k*, producing the alternating motion of the lever, as before described. In the figures already referred to is represented a mill of only ten or twelve inches in diameter in the grinding surfaces, which, requiring but little force, a quick motion is easily given without increasing the velocity of gear. But when it is desired to employ the entire strength of a man, a mill of from fifteen to eighteen inches in diameter is preferable; in which case the operator will work to more advantage by employing a slower first motion, and obtaining the required velocity of the mill by means of gear, as shown by the dotted parts in fig. 15, the power being applied to the handle *y*, on the axis of which is a toothed wheel *z*, that takes into a pinion of half its diameter on the axis of the fly wheel. The number of vibrations or alternations of the mill may vary from sixty to one hundred in a minute, without materially affecting the result, but my experience has led me to give the preference to about eighty vibrations per minute.

“ The principal inconvenience that would be produced by too rapid vibrations, is the heating of the flour or other materials; and to prevent this effect, I cause a stream of water to pass through an annular cavity made in the outer or fixed grinding circle. The water enters by a pipe on one side of the circle, and is carried off by another pipe on the opposite side of the circle; each of the pipes may be furnished with stop cocks, to regulate the admission and emission of the fluid.

“ This arrangement is represented by the dotted parts of fig. 14, and have not been drawn in full lines, as it will rarely be desirable to pass water through mills of such small dimensions, yet it equally serves to explain the principle of

the improvement when applied to those of larger dimensions. Instead of a cock on each of the pipes before mentioned, one will do on the pipe of discharge, only which being partially closed, would detain the water in the annulas sufficiently long to abstract the heat from the metal. There are however various ways of effecting this object of cooling mills, by a stream of water passing through or around them, and as the invention consists in the application of water to mills of metal, or alloys of metal, it would be needless to describe them more at length, as workmen of ordinary skill are competent to carry the application into practice, according to the circumstances of the case.

“ Having completed the description of one of the said patent mills of the simplest kind, I proceed to explain another of a more complex structure, although it consists of an extension of the same principle as the former. That which I have already described consisted of only two concentric grinding parts, but the improvement I have now to explain consists in the adaptation of any convenient greater number than two grinding parts, so as to obtain greater efficiency in a more compact and less expensive form than have heretofore been constructed. An arrangement on this principle is illustrated by figure 16, which shows a combination of five grinding rings, the three marked *a, a, a*, being fixed to the bed or frame of the mill, and the two marked *b, b*, which fit concentrically inside of *a, a, a*, are put into motion (of the alternating kind as before mentioned) against them. For this purpose the two rings *b, b*, are firmly connected to the bars *c, c, c*, which radiate from a vertical axis or spindle at *d*, that communicates the alternating motion from a vibrating lever moved by any convenient means. Another modification of a compound mill of a similar description to the last mentioned, is given more in detail by

the sectional fig. 17 where *e, e, e*, represent three grinding rings concentrically place around two other grinding rings *f, f*, the former being fixed to four radial equidistant arms *g, g*, and the latter connected to four other radial equidistant cross bars *h, h*, fixed to and moving with their vertical axis *i*. This axis has a sliding motion up and down, causing the circles *f, f*, to approach to or recede from the circles *e, e, e*; it is supported laterally at one extremity by a central boss, which is suspended by four inclined bars *j, j*, that are bolted to an horizontal cross frame above *k, k*, which has also a central boss that embraces the upper end of the axis, where the latter is provided with brasses to reduce the friction, as well as at the lower extremity, as shown in the drawing. The toe of the axis is made spherical, and turns on the concave surface of a piece of steel *l*, which is supported by a pin *m*, and a lever *n*; this lever having its fulcrum at *o*, and power being applied to the rod *p*, by turning the screw *q*, the axis is raised or depressed through the medium of *m*, and *l*. At *r*, is a curved lever bolted to the moveable circles, for connecting it to the vibrating motion; *s*, represents the conical hopper, and *t*, the cylindrical hopper (as in the before described mill), between which the substances to be ground are deposited.

“In applying water to these compound mills, it may be conducted by any of the known modes practised by workmen into hollow annular spaces formed within the fixed circles, and afterwards conducted off to a lower level, although the cooling of these fixed rings by currents of water or other fluid passing through them, will tend materially to reduce the temperature of the intermediate rings; water may be passed through the latter also; it may be introduced from above the mill, through a hollow vertical axis, and distributed thence by the radial connecting arms into the rings, whence by another passage it may be carried off

through the lower portion of the said hollow axis. A similar mode may be adopted of conducting water through the inner ring of the first described mill, but I consider that to be unnecessary, except in large mills moved at great speeds, and that the application of water to the outer ring of a single mill (as that first described), or to the intermediate or alternate rings of mills containing a greater number of concentric circles than two, (as in the quadruple mill last described,) will in most cases be found sufficiently efficacious. It will be observed that the teeth or notches on the surfaces of the mill described are inclined; the consequence of which is, that the grinding is not equally effective in the two reverse motions of the mill. To equalize the grinding effect in both directions, I give the preference to upright teeth instead of inclined. The power required to work mills with upright teeth must of course be augmented, but the effect is greater in proportion, and the resistance as well as the power is more uniform.

“ In the description I have now given of the several improvements which form the subject of my patent, I have necessarily included parts which are not new, and some parts that may be of doubtful originality; I therefore desire it to be understood that I limit my claims of patent right to the following improvements:—I claim, first, the alternating circular motion by whatever mechanical combination it may be produced, not only to the mills described, but to all other mills susceptible of its application; secondly, I claim the forming of compound mills by the concentric combination of a greater number of grinding circles than two, and the driving or actuating of these mills not only by *alternating*, but also by *continuous*, circular, or rotatory motion by any of the various modes known to mechanics; and, thirdly, I claim the introduction and passage of water or other fluid employed as a cooling medium, into and

through, not only the mills before described, but the application of the same principle (modified according to circumstances) to all other kinds of mills made of metal."—*[Inrolled in the Inrolment Office, June, 1832.]*

TO CAROLINE ELIZA ANN BURGESS, of Beauport, in the parish of Hollington, in the county of Sussex, spinster, for her invention of an improved apparatus for sketching, drawing, or delineating.—*[Sealed September 8th, 1832.]*

THIS invention of an improved apparatus for sketching, drawing or delineating consists of a frame or frames to be placed upon any convenient standard, for the purpose of holding a diaphaneous medium, upon which the outline of any figure or object seen within the area of the medium may be accurately and readily traced, sketched, or delineated by the hand of the observer.

The diaphaneous medium to be used in this improved apparatus consists, in the first place, of thin muslin or gauze, or such other description of fabric of a fine texture stretched over a transparent plate of glass, which muslin or other fabric is to constitute the diaphaneous medium intended to receive the outline of the picture to be traced upon it by a common black lead or chalk pencil. Or the transparent glass may be employed as the medium to be sketched upon by using a prepared pencil made of certain combinations of materials, by which the outlines of figures, or perspective views may be readily delineated upon the smooth glass without the intervention of the muslin or gauze. These sketches or outlines of any subject produced either

upon the muslin or gauze, or upon the glass, may afterwards be traced or transferred to the paper or other material, upon which the finished picture is to be drawn in the following manner. After the outline or sketch of the picture has been delineated upon the muslin or gauze by a common black lead or chalk pencil, the muslin or gauze is to be stretched over the paper or other materials, on which the perfect drawing is to be made upon a table or drawing board, and the lines retraced or marked over again with a black lead or chalk pencil; the artist at the same time giving the hand a slight tremulous motion, which will cause the pencil to mark through the meshes of the fabric, and draw the outlines upon the paper. When the sketch is made upon the smooth glass by the prepared pencil, which marks thereon in opaque lines, the paper to receive the picture must then be held in contact with the glass, having a light behind it as a transparency, so that the artist may trace upon the paper over the opaque lines with a common black lead pencil, and thus obtain the outlines of the picture upon the paper. By the employment of the mediums of gauze or muslin a great many sketches may be made, and carried in a compressed form.

In Plate VII, are represented in several figures this improved apparatus, which will fully illustrate the invention. Fig 1, is a front view of a frame intended to hold the glass and diaphaneous medium to be sketched or drawn upon this frame is made separate from the apparatus, and can be removed out of it for the purpose of applying the muslin and glass to it, or for retracing the outline or sketch. Fig. 2, is a section taken through the frame, showing its rebates, and the manner of securing the glass and distended muslin. Fig. 3, is a front view of the apparatus complete, mounted upon its standard; fig. 4, is a side elevation of the same; fig. 5. is a plan view; and fig. 6, is a vertical section taken

longitudinally through the middle ; fig. 7, is the complete apparatus shown in perspective ; *a, a*, is the frame holding the muslin and glass *b*, which is secured in the frame by buttons *c, c*.

On the face of the frame are placed a number of small metal pins or points standing outward, and on applying the muslin or gauze, it should be slightly stretched over the frame, when the metal points will catch hold of the muslin ; and on the glass being pressed down into the frame, as shown in fig. 2, the muslin will become stretched tight over its surface, and may be secured in that position by the buttons *c, c*.

The frame *a*, with the glass and muslin, is then put into the second frame *d*, fixed to the sliding piece of the table *e*, and secured therein by the buttons *f, f*, when the instrument will be ready for use. The apparatus shown in the drawings is represented as mounted upon three legs, jointed to a socket piece *g*, but it may have any other kind of support desired ; *h*, is a table having a pin *i*, attached to its under side, which fits into the socket piece *g*, and is secured by a thumb screw. This connexion allows the instrument to be turned round horizontally to face the object desired to be sketched, and when adjusted, it can be fixed by the thumb screw.

In sketching with this apparatus, it is necessary that the head of the artist should be kept steady, and in one position, during the time he is drawing ; for this purpose a head rest *k*, is placed opposite the frame containing the glass and muslin, which is shown affixed to the end of the table *h*.

The frame *d*, is attached to a cross piece *l*, on the end of the sliding part *e*, of the table, which moves between dove-tailed guides *m, m*, and allows of an adjustment between the head rest and the diaphaneous medium, and

when adjusted to the desired distance, is secured by a screw and pin *n*, passed through a groove in the sliding piece of the table. Fig. 8, is a perspective representation of the complete instrument, showing the position of the artist when sketching, that is, with his face placed in the head rest. If it should be thought desirable, an eye piece may be connected by an adjusting arm to the head-rest, but this is not thought necessary, except for very particular purposes. If the artist leaves off sketching before the outlines of the picture are completed, care should be taken on again commencing, to put the head in the same position as before, so that the lines already sketched may cover those of the object. The pencil for sketching upon the smooth glass may be composed of any compound or ingredient which will mark an opaque line upon glass; those which the Patentee uses for this purpose are composed of the following materials, although the Patentee does not intend to confine herself to that precise compound. For H. H. pencils is used a compound of two pounds of gum shelac, four pounds of best curd soap, one pound of best spermaceti, a quarter of a pound of gum mastic, two ounces of gambouge, half a pound of vegetable black; the whole well mixed properly together over a slow fire, and the composition run into grooves in wood in the same way as common composition black lead pencils are made. In order that the instrument may be more portable, the head-rest *k*, and the frame *d*, are mounted upon the table with hinge joints, to allow of their being turned or folded down, as shown in figs. 9 and 10, which are a plan and a side view of the apparatus in that position. When the frame *d*, is in an upright position, it is kept steady by buttons which confine the tail pieces *p, p*, of the frame *d*, against a part of the cross piece *l*; *q, q*, are buttons which keep the head-rest steady when in use, by pressing the tail pieces *r, r*,

against a part of the cross piece *s*, fixed on to the other end of the table ; *t*, *t*, are small studs or pins which fit into holes in the top of the frame *d*, when it is turned down and pushed up against the cross piece *s*, as represented in figs. 9 and 10, and by screwing the pin *m*, tight, the frame *d*, will be fastened down ; *u*, is a small weight or plummet suspended from the top of the frame *d*, by a slight cord, by which the artist can adjust the frame containing the diaphaneous medium to a horizontal and perpendicular position.

The Patentee states in conclusion, “ although I have herein showed and described an apparatus for sketching and drawing, which I consider as convenient and portable, I do not mean or intend to confine myself to that particular form of apparatus, as it may be made simply with the table, head-rest, and frame, without either hinge joints or adjustment ; and also the manner of supporting the apparatus when in use may be varied to suit convenience, as it may be used standing upon a table, or fixed upon the back of a chair, or upon a gate, by means of a screw clamp connected to the table *h* ; and I therefore wish it to be understood that I claim as my invention under the above in part recited Letters Patent, the application and use of muslin, gauze, or gauze lisse, or such other thin fabric of a fine texture as a diaphaneous medium to be sketched or drawn upon with a black lead, chalk, or other pencil ; and also the application and use of transparent glass as the medium upon which sketches or drawings may be made by a prepared pencil, which will mark opaque lines readily upon the smooth surface of the glass.—[*Inrolled in the Rolls Chapel Office, March, 1833.*]

Specification drawn by Messrs. Newton and Berry.

To JAMES MACDONALD, of the University Club-house, Pall Mall East, in the county of Middlesex, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of an improved construction of railways.—
 [Sealed June 29th, 1832.]

THIS invention of an improved construction of railways consists in a peculiar mode of arranging and combining bars, rails, or ribs of metal, so that the several bars, rails, or ribs, shall respectively sustain or support the pressure and tension of each other, and which combination is applied to the construction of roads or ways for the passage of train waggons and other carriages. This peculiar arrangement of bars, rails, or ribs, constitute when combined in certain lengths, a succession of very flat arches or segments of polygons, which will not require the lateral support of abutments, as they bear perpendicularly upon their piers placed at proper distances. The leading feature of this invention may be perceived by reference to the rafter, tiebeam, and king post of an ordinary roof; the structure of the improved road or way being a succession and combination of rafters, tiebeams, and king posts connected by transverse bolts. In order to render this more evident, we have exhibited in Plate VIII, at fig. 1. a pair of rafters *a, a* connected by a tiebeam *b*, with a perpendicular king post *c*. Fig. 2, shows three several pairs of these rafters with their king posts, and a continuous tiebeam connected by transverse bolts at *z, z, z, z*. Fig. 3, exhibits the same combination further strengthened by longitudinal bars *d, d*, which are also secured by transverse bolts at the points of intersection. Fig. 4, shows a second series of smaller rafters *e, e, e, e*, and king posts *f, f, f*, erected

upon the bars *d, d*, as their continuous tiebeams ; and fig. 5, is the same as the last figures, with the addition of a top rail *g, g, g*, which likewise is secured by bolts passed through the upper parts of the series of rafters and king posts.

Having thus explained the principle upon which strength and stability is obtained, suited to the construction of a railway erected upon columns, piers, or sleepers, at any height from the ground, by arranging and combining diagonal, horizontal, and perpendicular bars, rails, or ribs of metal, so as to produce nearly an equal tension and pressure of the parts, the Patentee proceeds to show the manner in which he proposes to form and connect the several pieces.

Fig 6, is a side view of one of the diagonal pieces or rafters *a, a*, drawn upon a larger scale ; fig. 7, is a similar view of one of the perpendicular pieces or king posts *c, c* ; these pieces are formed of bar iron, with holes in them at proper places, for the ends of the transverse bolts to pass through ; fig. 8, shows the perpendicular piece *c*, connected to a part of the continuous tiebeam *b, b* ; this continuous tiebeam is a chain formed of flat links of iron, having holes at proper places for the bolts or pins to pass through ; fig. 9, is a plan view of a portion of this chain or tiebeam ; and fig. 10, is a side view of the same ; fig. 11, is a plan, and fig. 12, a side view of a part of the longitudinal bars *d, d* : these bars are also flat links, and when placed in connexion with the other parts of the railway, as shown in figs. 3, 4, and 5, form a continuous chain. Fig. 13, is a side view of a portion of the top rail *g, g*, two of which are applied to each range of bars, rails, or ribs, to give additional strength. Fig. 14, is a representation of one of the transverse bolts or stretches *h*, the ends of which are passed through the holes pierced in the several bars, rails,

or ribs, and the whole is secured together by screw nuts, as shown in fig. 15, which is a transverse section taken through the complete railway, showing the structure resting upon its sleeper or plate of cast iron *i, i*, placed upon the pier, and also the manner of keeping the parallel ranges of bars, rails, or ribs, secure from lateral disarrangement by the ears or lugs *k, k*. Fig. 16, is another section, showing the railway as placed upon pillars or columns; fig. 17, is an elevation of a portion of a complete railway, in which is seen bearing at three points upon a sleeper, a column, and a pier; fig. 18, is a plan view of the same.

The Patentee then proceeds to state "Having now described the method of arranging and putting together the parts of the railway, it is necessary for me to state that in forming a railway on this improved plan, I should prefer constructing it in lengths or segments of from forty to fifty feet, the ends of such lengths or segments bearing upon the piers, pillars, or sleepers, and that I prefer using four parallel ranges or series of bars, rails, or ribs, arranged in pairs, and connected together by cross pieces or stretchers *l, l*, as shown in the sectional figures 15 and 16, and seen also in the horizontal or plan view of the continuous railway, fig. 18.

Each length of these ranges or series of bars, rails, or ribs, when put together, should form a very flat curve, which need not spring more than about one inch from the chord line in the lengths of fifty feet, and consequently all the upright pieces *c, c*, or king posts, should be in the proportion of radii from the centre of the circle of which such spring of the curve would form a segment, and hence the length or distance between the upper ends of the king posts or pieces *c, c*, would be something greater than the length or distance between their lower ends; but such difference would be very trifling in the erection itself, and the

spring of the curve of each length or segment being too small to be rendered evident in the figures.

The extremities of the separate lengths or segments of the way extending from one support to the next, are connected together over the centres of the bearings upon the piers or pillars by transverse bolts passing through elongated holes in the ends of the bars, in order to allow for any unequal expansion or contraction of the metal, or any slight deflection of the curve caused by any great weight passing along the way; but it will be evident that this construction or combination of bars, rails, or ribs of metal, contains a principle of compensation in itself, which will relieve the expansion and contraction of the materials under variations of temperature. The "*edge rails*" upon which the running wheels of the carriages are intended to travel, are of a T shape in their sectional figure, and may be held between the two top rails of each range or series, their flanges resting upon these rails, as at *m*, *m*, in figs. 16 and 17, and they are secured by the transverse bolts and nuts, as shown in those figures.

Another pair of edge rails at a lower level may be placed upon the bars which connect the two pair of railways or double ranges, as shown at *o*, *o*, in figs. 15 and 16, which may be used in addition to the upper railways for the transportation of any light weights. It may be requisite in some parts of the railway to affix a shield or side guard, as shown at *p*, *p*, in figs. 15 and 16, which may be lined with iron plates for the protection of the carriages, when the way is elevated considerably above the ground; or in other cases a plain balustrade may be applied.

Having thus explained the principles upon which I obtain strength and stability by a peculiar arrangement and combination of diagonal, horizontal, and perpendicular bars, rails, or ribs of metal, and also having described the

manner in which I propose to shape and connect the several parts so as to form a railway of an improved construction, I claim under the above in part recited Letters Patent, the improved construction of railways or ways formed by the peculiar combination of several series of bars, rails, or ribs of metal, arranged and connected as herein above described.—[*Inrolled in the Rolls Chapel Office, December, 1832.*]

Specification drawn by Messrs. Newton and Berry.

To JOHN JACOB PARKER, of Birmingham, in the county of Warwick, gentleman, for his invention of certain improvements in fountain pens.—[Sealed 26th of July, 1832.]

THE Patentee states in his Specification of the above Patent, that his invention consists in the arrangement of the parts of fountain pens, whereby he produced pens capable of containing a supply of ink, which may be made to flow to the nibs at the time of using, and afterwards to cause any ink remaining in the pen to flow back into the handles or upper parts.

Plate IX. fig. 1, shows one of these fountain pens complete. Fig. 2, is a section, taken through the same, showing the relative situations of the parts. Figs. 3, 4, 5, and 6, are detached representations of some of the various parts of which the pen is composed: the same letters being marked on similar parts in all the figures; *a*, is the outer case or handle of the pen; fig. 3, is a section of the cap or cover *b*, shown detached; on the inside of this cap or cover *b*, is fixed a pin *c*, this pin acts as a plug or stopper

to the ink way when the pen is not in use, the cover *b*, being placed over the nibs to protect them ; by this means the flow of ink will be prevented, excepting when the pen is used ; *d*, is a piston, the rod of which has a screw cut thereon, a three threaded left handed screw being preferred, as it obtains a more easy motion to the piston.

The piston rod is flat on two sides, and passes through a rectangular hole formed in a cross plate *f*, affixed in the ink cylinder, the piston being thereby kept from turning round, as it is forced up and down by the motion of the screw upon the rod, as will be more fully described hereafter ; *e*, is the ink cylinder, or chamber which contains the ink, and in which the piston is caused to rise and fall by means of the piston rod.

At the upper end of the ink cylinder *e*, is affixed the circular plate *f* ; through this plate is formed a rectangular perforation, in which the piston rod works, and thus the rod is prevented turning round ; *g*, is a ring, placed above the plate *f*, to enable the tube *h*, to turn freely ; the end of this tube *h*, has an outward flange *i*, which comes against the ring *g*, shown more particularly in the detached view fig. 4, of the tube *h*, and its flange *i*.

The tube *h*, is kept in its place within the upper part of the ink cylinder by means of the short tube *j*, which slides over the tube *h*, and is soldered into the upper part of the ink cylinder, and thus the flange *i*, of the tube *h*, is securely retained between the ring *g*, and the tube *j*.

Within the end *i*, of the tube *h*, is formed a few threads of a female screw, and the piston rod being passed within the screw and tube *h*, on turning the tube *h*, round, it will cause the piston to be forced down the ink cylinder and supply the pen with ink. The piston may also be withdrawn when ink is no longer desired in the pen, by turning the tube the reverse way, by which latter action the ink, which

is unused, will be returned to the ink cylinder; *k*, is the top part of the outer casing of the pen, which has a small hole perforated in its end for the pin *c*, to pass through; when the cap or cover *b*, is placed on the upper end of the pen for the purpose of elongating the handle, as is shown by dotted lines in fig. 1. There is a pin passed through the outer casing *k*, and the inner tube *h*, so that when the outer tube *k*, is put in its place, and turned backwards or forwards, it will cause the tube *h*, to turn in a like direction, and thus actuate the piston within the ink cylinder.

To the lower end of the ink cylinder is affixed by soldering the pen holder *z*, which is shown separately in fig. 5, and in section, at fig. 6, and consists of two tubes *l*, and *m*; the inner one *m*, having a small hole drilled through it for the passage of the ink from the cylinder, as is more clearly shown in the sectional figs. 2, and 6, it will be seen that the hole or ink way is opened, or made bell mouthed, in order that the ink passing from the ink cylinder may have an inclination to fall immediately on to the nibs of the pen.

The Patentee having described the various parts, and the manner of combining the same, he proceeds to describe the manner of filling and using the pen. In order to fill the ink cylinder, the piston is first forced down to the lower end of the ink cylinder; the end which forms the nib holder is then dipped into ink, when the piston is to be made to move upwards, by which means the ink will be passed into the cylinder by the atmospheric pressure, and the cylinder will become filled with ink. The nibs, whether of quill or metal, are then to be put into the holder between the tubes *l*, and *m*, and the pen will be fit for use. A constant supply of ink may be kept to the nibs whilst writing, by turning with the left hand the part *k*, of the outer casing. The Patentee observes, that he prefers left

handed screws to be made on the piston rods, by which the desired motion for supplying ink to the nibs will be more readily communicated.

When the pen is no longer desired to be used, the part of the casing *k*, is to be turned in an opposite direction, which will cause the piston to be raised in the ink cylinder, and consequently any ink which remains in the lower part of the pen or nib holder will be made to follow the piston by the pressure of the atmosphere ; the cap or cover *b*, is then to be placed on the lower end, and the wire *e*, will plug up the end of the ink way in the holder, and thus prevent the flow of the ink in case the pen should be laid horizontally, as well as keep the passage at all times clear when the plug is withdrawn.

The Patentee states, in conclusion, " That having now described the nature of my invention, and the manner of carrying the same into effect, I would observe that I construct the same of gold, silver, or other suitable material, taking care that the ink cylinder is constructed of such a material as will be as little as possible acted on by the ink ; and I do declare that one of the objects of my invention is the lining of the ink cylinder with a tube of glass, or I form the ink cylinder wholly of glass, or I sometimes line such ink cylinder with gold, to prevent the injurious effects of the ink, and it will be evident that the outer casing may be ornamented by engine turning or otherwise, and that the same may have a seal or other device on one end, taking care that there is a small hole drilled to admit the air to prevent a vacuum being formed in the cover when it is removed for the purpose of using the pen.

" I would have it understood that I lay no claim to the various parts of which the invention is combined, they mostly being known and in use in their separate condition. But what I claim is, first the using two or more threaded

screws for working the pistons in fountain pens, by which considerable power is obtained with the exertion of but a small force, in consequence of the slow progress of the screw, yet by such means a very careful adjustment may be obtained in supplying ink to the pen ; and although I have here stated a two or more threaded screw, I prefer a three threaded screw.

“ Secondly, I claim the use of a left handed screw to the working of the pistons of fountain pens, by which the supply of ink is more readily obtained whilst the pen is in actual use in the right hand.

“ Thirdly, I claim the particular combination of the various parts as a fountain pen, although such parts are in themselves well known and in use ; and, fourthly, I claim the lining of the ink cylinder with glass or gold to prevent the prejudicial corrosive action of the ink, which in most other materials is very great, though in many common articles I sometimes omit such linings of glass or gold, yet I prefer the using of such materials, as the pens will be much more lasting by the application.”—[*Inrolled in the Inrolment Office, January, 1832.*]

To HARRY SCRIVENOR, of New Broad-street, in the city of London, gentleman, for his invention of a certain improvement or improvements in the construction of iron railways.—[Sealed 6th November, 1832.]

THE nature of the above invention is stated by the Patentee to consist in constructing those parts of railways usually called chairs or pedestals of wrought iron, instead of cast iron, heretofore used for that purpose, and either in

one single piece or more pieces as may be thought best for the particular railroad on which they are intended to be used; and describes his improvements in the following manner, reference being had to the several figures of this invention in Plate VI.

In fig. 17, *a, b*, represent a pair of cast iron metal rollers, mounted in proper frames or bearings, and having a series of grooves or indentations in their peripheries corresponding with the several shapes which the metal is intended to take during its progress through these rollers in the operation of rolling, until it at length attains the exact shape required to form the chairs or pedestals; for example, the grooves or indentations at *c, d*, are formed to receive an ordinary, short, thick, bar of wrought iron, of the size adapted for these rollers, say about two feet long, and six inches square, brought to the required heat for rolling.

The heated bar is first passed through the rollers at *c, d*, which causes it to assume the shape shown at *j*; it is then passed in succession through the other grooves *k, k, l, l, m, m*, and *n, n*, whereby it is successively rolled into the forms shown at *e, f, g, h*. Having thus obtained a long bar or length of iron, of the form shown in section at *h*, it is next cut into proper lengths for chairs, which is done by means of a pair of mill shears of the common construction, which may be worked in the ordinary manner; but these shears must be provided with jaws of a proper shape and form to receive the chair or bar *h*, otherwise the action of the shears in cutting off the lengths from the bar would be apt to force it out of shape.

It may be well here to observe, that as the forms of the chairs would necessarily vary to suit the form of rails to be used with them, and the Patentee has shown and described only one form of rails, which he has selected as being one of the most approved form, and in general modern use,

and states that chairs may be made of wrought iron on the same "principle" above described, to suit any of the ordinary forms of rails now in use; and then proceeds to describe the chair, constructed as above, for the rail shown in section in fig. 18.

Having cut the rolled bar *h*, into proper lengths for chairs, the next process is to shape the cheeks *o*, *p*, (see the sectional fig. 19,) more accurately to fit the rails, to be placed in the chair, which in its present state would have the appearance shown in fig. 19, and of course would be too unsteady for the purpose required. In order to effect this shaping, and to form at the same time a proper recess in the cheek *o*, for the key used to wedge up the ends of the rails tight in the chair, a cold wrought or cast iron mandrill *i*, (as shown at figs. 20, 21,) is placed in the recess in the chair, which, having been previously heated again in the furnace, is made to pass through another pair of rollers, as shown at fig. 22, together with the mandrill, which rollers press the cheeks *o*, *p*, close upon the mandrill *i*, and when the chair leaves these rollers, it is complete; and the mandrill being withdrawn, the rail may now be inserted in it, as at fig. 23; *r*, being the recess into which the wedge or key is to be driven, to fix the rails firm and steadily in their places; *z*, *z*, are the holes for the spikes or fastenings which confine the chair to its block or support.

Fig. 24, is a vertical section of a wrought iron chair, made of more than one piece; in this chair the cheeks are made to fit the rail by rivetting pieces of iron of the proper shapes to the cheeks of the chairs after they leave the rollers, as at *n*, *n*, in fig. 17, in which case they will not require to be passed through the rollers fig. 22. The cheeks *o*, *p*, of the chair having plain sides, and parallel to each other, pieces of rolled iron *s*, *t*, are firmly secured to the insides of them by rivetting, as shown in the figure. Fig. 25, shows

the chair, with a wrought iron rail placed within it, and secured firmly by means of an iron wedge or key driven tight in underneath the overhanging piece *s*, and pressing upon the shoulder the rail *q*. This plan of wrought iron chair will be found useful when the lower part of the rail for which it is intended may be of any shape differing from the ordinary kind. Fig. 26, is a side view of a chair, with a part of a rail place with it ; and fig. 27, is an elevation of another broader chair calculated to receive the ends of two rails at a junction.

Having described the nature of his invention, the Patentee states in conclusion, that he claims as his invention, "the substitution of wrought or malleable iron in place of cast iron in the construction of those parts of iron railways called chairs or pedestals, whether the same be made in one single piece or of separate pieces rivetted or otherwise fastened together, as hereinbefore described."—*[Inrolled in the Inrolment Office, January, 1833.]*

To WILLIAM BROWN, of Liverpool, merchant, for certain improvements in steam engines, communicated to him by a certain foreigner residing abroad.—[Sealed June 9th, 1832.]

THIS invention is described by the Patentee to consist in a certain arrangement of apparatus for producing a slide valve to a vibrating cylinder of a steam engine, whereby the steam will be alternately admitted to the cylinder, and cut off therefrom by the vibration of such cylinder.

Figure 7, Plate IX, is an elevation of the engine, and figure 8, is a plan view thereof : the same letters indicate similar parts in all the figures ; *a, a*, is the framing

on which the engine is mounted; *b*, the engine or steam cylinder which vibrates on axes *c, c*, turning in bearings *d, d*, one on each side of the cylinder; *e*, is the piston rod, which it will be seen passes through both covers of the steam cylinder, there being stuffing boxes *f, f*, formed on the covers at each end of the cylinder; these stuffing boxes are made considerably longer than is usual with fixed engines, the object being to give as much bearing at each end of the cylinder for the piston rod as possible; into these stuffing boxes is placed hemp, cotton, or other material usually employed for packing, and keeping the covers of the cylinders steam tight at the parts through which the piston rod works; *g*, is the crank to which the piston rod is applied by the strap and keys, as usual, and *h*, is the main shaft, to which is to be connected any mill work, or other machinery, which the engine is intended to drive; *i*, is a fly wheel affixed to the shaft *h*: this shaft *h*, turns in bearings *j, j*, which are screwed to the top of the framing *a, a*.

In fig. 7, the dotted lines indicate the positions to which the vibration of the cylinder *b*, on its axis, causes it to assume, by which it will be evident that the steam ways or apertures formed at each end of the cylinder, as is shown at *k, l*, in fig. 9, which is a side view of the cylinder, will at each vibration of the cylinder, be caused to move through a space equal to that between the dotted lines *m, m*, at each end of the cylinder, and thus with such openings be alternately brought to the induction passage, or to the point, at which the admission of steam to the cylinder takes place, and then to the eduction passage, or the point at which such steam, after having acted on the piston, is emitted from the cylinder, either to the condenser or into the open air, according whether the engine is used as a condensing or a high pressure engine.

In figs. 8 and 9, *n, n*, are two ground surfaces or plates affixed to the side of the cylinder through which the openings or apertures *k* and *l*, are formed, which admit steam on each side of the pistons; these plates *n, n*, are caused to slide or act against two similar ground plates of the steam box or pipe *o*, and eduction ways hereafter described.

In figs. 7 and 8, *o*, is a circular flat pipe or box for admitting steam into and out of the steam cylinder, a plan of which is shown separately in fig. 10, and a section thereof in fig. 11, by which figures its formation and construction will be readily understood. On to the side next the steam cylinder there are two ground plates *p, q*, having two openings or apertures in each plate at *r, s*, and *t, u*, for the admission and emission of steam, as will be fully described hereafter; this circular pipe or box is kept to the position shown at figs. 7 and 8, the screw *v*, passing through the clamp *w*, shown separately in fig. 12, the lower part of the circular pipe being supported by the framing *a*.

It will be seen by the section of the circular pipe fig. 11, that there are two partitions *x, x*, which are between the openings or apertures *r*, and *s*, and *t*, and *u*, so that when the steam fills the lower compartment or division of the circular pipe *o*, the upper compartment or division acts as an eduction way for the steam, for both ends of the cylinder, and when the upper compartment is the compartment open to the boiler, then the lower compartment acts as an eduction way for the steam to escape from the ends of the cylinder. In fig. 8, *y*, is a branch pipe, shown in detached figs. 13 and 14; this branch pipe is affixed by means of its flange *A*, to other flanges *A*, formed on the circular pipe *o*, by means of screw bolts and nuts. On the front of the branch pipes *y*, is formed the circular plate *B*, having four holes *C, D*, and *E, F*, which enter into the branch pipes *y*,

such pipes having no direct communication the one with the other ; *g*, is another circular plate, shown detached in fig. 15, and in its place in fig. 8, this plate is screwed in front of the plate *B*, by the screw *H*, and in such manner that the cavities or recesses *I*, and *J*, shall connect the holes *C*, *D*, and *E*, *F*, that is, the cavity *I*, shall cause there to be a connexion or steam way from *E*, to *F*, the object of which will be fully described hereafter ; *K*, is a hole, drilled into the plate *G*, into which a handle or lever is to be inserted, when it is desired to turn it to open or shut either passage.

The surfaces of the plates *B*, and *G*, are accurately ground, so that when they are screwed together, they shall be steam tight, and only permit the steam to pass by the cavities or ways, as before described.

Having now described the various parts of the engine, the Patentee proceeds to describe the manner of its action, in doing which, it must be supposed that the steam pipe leading from a boiler, is connected with the flange *L*, of the branch pipes *y* ; the steam would then flow through the aperture or way *c*, in the plate *B*, through the way *D*, and thence into and fill the lower compartment of the circular pipe, or steam box *o* ; the steam will pass from thence into the steam cylinder *b*, whenever either of the ways or apertures *k*, and *l*, are opposite the openings or apertures *u*, and *s*, and the steam will be emitted from the ways or aperture *k*, and *l*,—whenever either of these openings are opposite the apertures *t*, and *r*, respectively ; for instance, supposing that the crank moved in the direction of the arrow, the outer end of the cylinder *b*, would be depressed, and the aperture *k*, would be open to the lower compartment of the steam pipe *o*, at *u*, and steam would flow into the cylinder to actuate the piston ; meanwhile, the aperture *l*, of the cylinder *b*, would be opposite the aperture *r*, by which the steam, after having acted on that side of the

piston, would pass into the upper compartment of the circular pipe or box *o*, either to a condenser, or to the open air as required. The continued rotation of the crank *g*, would cause the other end of the steam cylinder to be depressed, by which the steam would be cut off from the aperture *k*, and opened at the aperture *l*, which would bring the aperture *k*, to be opposite the aperture *l*, to allow of the emission of the steam from that side of the piston.

It will be evident that the surfaces of the plates *n* and *u*, and *p*, *q*, must be very accurately ground, or have elastic packings, in order to keep the same steam tight. In case the engine is intended for a condensing engine, then the pipe which leads to the condenser is connected to the flange *m*, and it will be necessary to apply the requisite parts, and cause them to be worked by the engine. If the engine is intended for a high pressure engine, then it will only be necessary to attach a pipe at the flange *m*, to convey the steam from the engine in the direction required. When it is desired to change the working of the engine, or to cause the crank to turn in the opposite direction to that which it has been working, it will only be necessary to turn the plate *g*, by means of a lever or handle placed in the hole *κ*, in such manner that the cavities *i*, and *j*, shall open a way between *c*, and *e*, and *d*, and *f*, by which means the upper compartment of the pipe *o*, will be converted into the steam compartment, and the lower compartment into the eduction way for the steam after it has actuated the piston.

Having described the nature of this invention, the Patentee states in conclusion, "I would have it understood that I lay no claim to a steam engine having a vibrating cylinder, that description of engine being well known and in use; but what I do claim is the arrangement of the plates *n*, *n*, on the steam cylinder *b*, and the plates *p*, *q*,

on the circular steam pipe *o*, which are caused to act together as slides for admitting and cutting off the supply of steam by the vibration of the steam cylinder, as above described.—[*Inrolled in the Inrolment Office, December, 1832.*]

To ROBERT WALTER WINFIELD, of Birmingham, in the county of Warwick, brass-founder, for his invention of certain improvements in the construction of bedsteads, one or more of which said improvements is or are likewise applicable to other articles.—[Sealed 22d December, 1831.]

THE Patentee states in his Specification of the above, that one of his improvements consists in making the legs and pillars of bedsteads of one entire tube, either formed of metal, or of metals containing wood or other materials, withinside the said tubes : these tubes may be either of the same size throughout, or made larger below, and smaller above, or the reverse, and formed either cylindrically or tapering ; by this mode the ordinary method of forming the legs or pillars of metallic bedsteads of two or more parts. screwed or otherwise fastened together, is avoided, and consequently a degree of firmness is attained, and labour saved.

Another improvement consists in the methods of affixing the sides and ends of metallic bedsteads to the legs and pillars formed of entire tubes.

Fig. 16, Plate IX, represents part of a leg and pillar for a metallic bedstead, shown in section, the upper part having been reduced in size by drawing it through proper tools in the usual manner. Fig. 17, is an elevation ; and

fig. 18, a plan of part of a similar tube *a, a*, upon which a square metal boss or corner of a bedstead *b*, has been affixed by forcing the tube *a, a*, through a hole in it up to the part where it is required to remain; when it is firmly secured in its place, by screws or otherwise. From two sides of the boss *b*, plugs *c, c*, project, to which angle iron sides are affixed by screws and nuts, the screws passing through holes *d, d*, in the plugs *c, c*. Fig. 19, and fig. 20, are similar views to figs. 17 and 18, showing the angle iron *e, e*, attached to the plugs *c, c*, by the screws *f, f*, and nuts *g, g*.

Instead of forming projecting plugs upon the bosses *b*, to receive the angle iron, the Patentee sometimes forms dovetail grooves in two of the sides of the bosses, as shown at *h, h*, in the plan and side views, figs. 21 and 22, into these dovetail grooves *h, h*, are inserted the dovetailed pieces *i, i*, figs. 23 and 24, which are formed on the ends of cylindrical metal plugs *j, j*.

These plugs *j, j*, are inserted and firmly affixed into the ends of metal tubes *k*, intended to form the sides and ends of the bedsteads, as shown in figs. 25, 26, 27, 28, and 29; fig. 27, being a side, and fig. 28, a plan view, and showing parts of two tubes *k, k*, united therewith. Fig. 29, represents part of a tube *k*, to be fitted on the plug *j*, and is afterwards to be covered with a ring or ferrule *l*, fig. 30, as shown in figs. 25, 26, 27, 28, and 29, for strength and ornament. Another of these improvements consists in the application of metallic sides and ends, and also metallic substitutes for sacking to the wooden legs and pillars of bedsteads, with a view to the preventing the harbouring of bugs, fleas, &c.

This improvement is effected in the following manner:—fig. 31, represents part of a wooden leg and pillar of a bedstead, upon which is affixed a square metal boss *b*, with

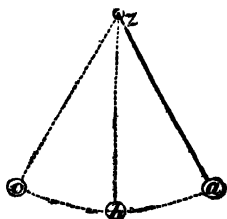
two square plugs *c, c*, to receive angle iron in the way above described, or dove tailed grooves may be formed in two of its sides, in order to receive dovetailed pieces of metal mounted on the ends of metallic tubes, instead of angle iron sides and ends ; fig. 32, is a plan of the boss *b*, with its two plugs *c, c* ; fig. 33, is a plan of another metal boss with dovetailed grooves *h, h*, made in its sides, to receive the solid metal dove tailed parts as above described ; fig. 34, is a side view thereof.

The Patentee states in conclusion, that although he has shown the apertures in the middle of the bosses, as being round or square, yet he does not intend to confine himself to those shapes only, but to make them hexagon or octagon, or any other form as thought desirable ; and further, that although he has hitherto described these improvements as applied to the construction of bedsteads only, yet he does not intend to limit himself to that application ; and states he also employs means of avoiding the usual methods of combining the parts of metallic and wooden bedsteads in any other case when it may be found expedient to do so, as for instance, in framing sofas, and concludes his Specification as follows :—

“ I do not mean or intend hereby to claim the affixing the sides and ends of metallic beadsteads to the legs and pillars by means of plugs, where angle iron is used, or dovetails where tubes are used, to form the said sides and ends, but only in combination with my improved mode of forming the said legs and pillars in one piece, and of affixing the bosses upon them”.—[*Inrolled in the Inrolment Office, June, 1832.*]

To RICHARD BADNALL, the Younger, formerly of Ashenhurst-hall, near Leek, in the county of Stafford, but now residing in the town of Douglas, in the Isle of Man, gentleman, for his invention of an improvement in the construction or formation of the trams or rails or lines of rail or tram-roads, upon which locomotive engines shall or may work.—[Sealed 8th September, 1832.]

THIS improvement in the construction or formation of the trams or rails, or lines of rail or tram-road upon which locomotive engines shall or may work, will be best illustrated by reference to the oscillation of a pendulum. If a



plummet suspended by a string from the point *z*, be drawn away from the perpendicular line to the point *a*, and there let go, it will fall by its gravity to *b*, in the arc *a, b*, but on its falling it will have acquired so much momentum as will carry it forward up to a similar

altitude at point *c*. Let it be supposed that a line of rails, or tram-way for carriages, be so constructed from the summit of two hills across a valley, that the descent from the one hill as *a*, to the valley *b*, shall subtend a similar angle from the



horizontal line, to the ascent up the other hill from *b*, to *c*. Now if a tram-wagon as *d*, be placed at the summit of the declivity *a*, it will by its gravity alone run down the

descending line of rails to the lowest point *b*, but in so running, according to the principles of the oscillating pendulum, it should have acquired a momentum that would carry it forward without any additional force up the ascending line to the summit of the hill *c*, being at the same altitude as the hill *a*.

It is quite certain that this would really take place if the velocity of the momentum was not impeded by the friction of the wheels of the carriage upon their axles, and upon the rails on which they run. Hence subtracting the amount of friction as a retarding force from the momentum which the carriage has acquired in descending from *a*, to *b*, it will be perceived that the momentum alone would only impel the carriage part of the way up the ascent *b*, *c*, say as far as *z*.

The Patentee states in further explanation of his invention, that "it will now be perceived that the carriage *d*, would not only pass down the descending line of road from *a*, to *b*, by its gravity, but that the momentum acquired in the descent would also impel it up the second hill as far as *z*, unassisted by any locomotive power. In order therefore to raise the carriage to the top of the second hill, I have only to employ such an impelling force as would be sufficient to drive it from *z*, to *c*, the whole expense of locomotive power for bringing the carriage from *a*, to *z*, being saved."

"If now I employ a small locomotive power to impel my carriage from *a*, to *b*, I by that means obtain a greater momentum than would result from the descent of the carriage by gravity alone, and I am therefore enabled by that means to surmount the hill *b*, *c*, having travelled the whole distance from *b*, to *c*, on the undulating line of road with much less locomotive power than would have been

requisite to have impelled the carriage the same distance upon a perfectly horizontal plain.

“Having now set out the principles upon which my improvement in the construction of tram-roads or railways are founded, I desire it to be understood that I claim as the subject of my invention the forming of trams or rails, or lines of rail or tram-roads, in such an undulating curve or curves as will enable me to combine the advantages of momentum from gravity when running down the descending curves of hills, with the power of locomotive engines to be employed thereon ; I do not confine myself to any particular extent of line or form of curve, but vary and adapt the curve or curves according to the surface of the country, or the local circumstances.”—[*Inrolled in the Inrolment Office, March, 1833.*]

Specification drawn by Messrs. Newton and Berry.

To FREDERICK WILLIAM ISAAC, of Charlotte-street, Fitzroy-square, in the county of Middlesex, ivory, tortoise-shell, and pearl worker, for his having invented certain improvements in ornamenting the finger keys, and other parts of piano-fortes, organs, and other musical instruments.—[Sealed June 28th, 1832.]

THE above invention of improvements in ornamenting the finger keys of piano-fortes, organs, and other musical instruments is described by the Patentee to consist in new and improved modes of covering those parts of them which are usually either veneered with ivory, or made of ebony, with pearl, tortoise-shell, turtle-shell, or other fit and proper, rich and beautiful materials, so as not only to add greatly to their splendid and elegant appearance,

but also, from the superior hardness, glossiness, or high polish of their surfaces, to facilitate the rapidity of the fingering in the performance of quick and brilliant passages in musical compositions.

In covering the finger keys with pearl, the Patentee employs the following improved method, which is described in the Specification in the following manner:—"Instead of merely cementing flat plates or lamina of pearl to the wooden parts of the keys, by means of glue, as usual, I compose a superior cement in the following manner: to a solution of the best Salisbury or other English glue made in a leaden glue pot, with fresh ale to a proper consistency, I add a small quantity of isinglass which has been previously dissolved in a mixture of ale, and of acetic acid or vinegar by a gentle heat, and also a little boiled linseed oil; and when the whole have been thoroughly incorporated by stirring them together at a simmering heat, I add a sufficient quantity of the fine German carbonate of lead, called "Khrem's White" in commerce, or the finest plaster of Paris, finely powdered and sifted, to give to the cement a uniform white colour. The intent of these additions to the solution of glue in all being to give it the power of resisting the atmospheric changes of heat and cold, and moisture and dryness, and also to suit it to the white colour of the pearl, and therefore these said additions must be varied in their proportions accordingly, and agreeably to the different qualities of the said component materials.

"In addition to this superior cement, and especially to guard against the ill effects of hot climates, I introduce between the lamina of pearl and the wooden part of the keys, a slip of cloth, such for instance, as hempen, linen, or cotton shirting, or of woven silk, or the fine woollen fabrics known as cashmeres or merinos, or cloths of any

other materials, and of about the same thickness as the above ; or instead of cloth, slips of vellum or parchment may be also used with advantage, the intent being to counteract the great tendency of glue to shrink and contract in drying, and thereby cracking and loosening by the introduction of the above, or similar partially elastic and yielding materials.

“ I fill the pores or interstices of the said cloth with the above composition or improved cement, by laying it upon the wooden part of the finger key, and by repeatedly striking the brush, or Dutch painter's tool filled therewith, upon the surface of the said cloth, until they are completely saturated therewith, and the cement passes through and effectually binds the cloth to the wood, when they are to remain till they become perfectly dry. I then coat the surfaces of the cloth, and of the pearl, with the cement in a similar manner as when the common glue is used, and laying them together in their place, I employ the heated caul in the ordinary manner of veneering, to press the parts together, and to expel the extra quantity of cement which would otherwise remain.

“ In using vellum or parchment instead of cloth, I merely brush them over with cement, instead of striking the brush upon them in the manner above described.

“ When the cement is become hard, the pearl is to be cleaned off, and prepared for polishing in the German manner ; first with pumice stone, powder and water, and then with rotten stone, powder and sulphuric acid, applied upon a soft woollen cloth, with which the pearl must be rubbed until a beautiful polish is obtained. I can also employ the above cement and cloth, vellum or parchment, in veneering the finger keys with ivory and with similar advantages.

“ In veneering the short finger keys with tortoise-shell or turtleshell, I employ a similar cement to that before described, only that it is coloured yellow, green, maroon, red, black, or of any other colour required, by using properly ground and sifted colours accordingly ; I likewise have the cloth dyed of similar colours, and cement it upon the wooden parts of the keys, in the manner above mentioned. I then apply the tortoise-shell or turtle-shell with the cement, in the usual manner of veneering with tortoise-shell ; and, lastly, polish it also in the usual way.”

In order, however, to facilitate the process of veneering the short finger keys with tortoise-shell or turtle-shell, as well as also to render it more durable, and instead of laying the shell upon the wood in several parts or pieces as usual, the Patentee forms the shell into a solid cap or coat, in the shape of the key by means of male and female dies employed in a screw press of the common construction, and immersed in boiling salt water.

The boiler described in the Specification to be used for this purpose is a square cast iron or other metallic box open at the top, and placed over a small furnace or German stove. The press and shaping dies, with the tortoise or turtle-shell to be operated upon, are placed into this boiler, and submitted to the action of boiling salt water. On the top of the press there are two projecting pieces or stretchers to steady the press in the boiler, and on the sides of the boiler are formed guides to steady the bottom plate of the press within the boiler.

The pair of dies employed for this purpose are of the required shape, to form two coverings or veneers for the short finger keys at one time ; the lower die containing the recess is placed upon the bottom plate of the press, and the upper one is moved up and down the press of the screw between guides in the usual manner.

The projecting part of the top die is made to fit the hollowed part of the top die, in such a manner as to allow of a sufficient thickness of tortoise or turtle-shell to lie between them when compressed by the action of the screw of the press (which is turned by a lever projecting over the top of the boiler), so as to form two caps or coats in length at one pressing, which may be afterwards cut into two parts or coverings for the short finger keys.

Having described the methods of ornamenting the finger keys of musical instruments, the Patentee proceeds to describe the other parts, to which these improvements are applicable, and proposes to ornament "the name boards, the key slips, the cheek pieces, and the candle boards; all these may also be advantageously veneered with tortoise or turtle-shell, or with buhl, at discretion, by employing the above mentioned improved cements, and introducing the cloth, vellum or parchment in either of the before mentioned methods; and further states, in conclusion, I can likewise greatly improve the art of veneering the cabinet or wood parts of musical instruments with common glue, by introducing a bed of linen, hempen, or cotton sheeting, in the above manner. I do not mean or intend hereby to claim as my invention any of the various means or methods herein mentioned which may already have been known or in use; but I do hereby claim the introduction of the woven fabrics or cloths, or vellum or parchment, in order to afford a degree of elasticity to the glued or cemented veneers; and I likewise claim the formation of the tortoise-shell and turtle-shell caps or coats for the short finger keys in one solid piece, by means of the screw press and dies, instead of veneering them with separate pieces."—[*Inrolled in the Inrolment Office, December, 1832.*]

NEW PATENT LAWS.

IN our last we gave as correct a statement of the several clauses proposed in Mr. Godson's Bill for amending the Patent Laws as we were then able to furnish, and which it appears was very nearly a literal copy of the Bill itself. That there were some points not exactly calculated to produce the best results, must have been obvious to most of our readers, and on a measure of such importance to the inventive portions of the community, all the bearings of which could not perfectly seen by the learned gentleman who proposed the Bill, a few suggestions resulting from an extensive practical acquaintance with Patents, and the legal proceedings upon those subjects, may not be deemed intrusive.

We have therefore drawn out the scheme of a Bill embodying those amendments, which appear to be necessary, not captiously differing from the proposer on any trifling unimportant points, but embracing as much of his measure as we conceive would be conducive to the establishment of a useful code, and adding our views by alterations or additions to such clauses as appeared to be insufficient or inadvisable.

We are, however, far from supposing that the views which we have taken will obtain the approval of every Patentee, or indeed must the necessities of the case in every particular, but they may serve as a guide to the proceedings of such public meetings as we find are about to be held in many of the large manufacturing districts, in compliance with the suggestion which we offered in our last.

Proposed Bill, amended.

WHEREAS it is expedient that the Laws respecting Letters Patent for Inventions should be explained and amended ; *Be it therefore*

referred by the said Secretary of State to his Majesty's Attorney or Solicitor-General, who shall report thereon and make out a Bill, as heretofore, and that the said Bill be carried to the other Offices, for the purpose of Letters Patent being made out and receiving the Great Seal of England.

Board of Scientific Advisers.

AND whereas it is necessary for the detection of Frauds and the prevention of improper Letters Patent, and also for the determination of the priority to be given to Letters Patent, that his Majesty's Attorney or Solicitor-General should have the assistance of men practically versed in Arts and Sciences; BE it further Enacted, that the Attorney-General and Solicitor-General be empowered to appoint a certain number of Persons learned in the Arts and Sciences, and Manufactures, to constitute a consultative Board, all Petitions to whom for Letters Patent, and all Specifications shall be referred, for the purpose of advising the consciences of the Attorney or Solicitor-General as to his Report upon the Petition to His Majesty.

Priority of Patent Right.

AND be it further Enacted, that in order to prevent any irregularity as to priority of Patent Rights, every Patent shall be secured (if ultimately granted) from the day and hour of presenting the Petition: provided the Petitioner causes all subsequent Fees to be paid, and application to be made at the proper Office for appending the Great Seal to his Patent within *Three Months* from the date of his Petition: in default of which all Fees paid, and Privileges resulting therefrom, to be forfeited.

Caveats to be entered against the Report.

AND whereas it is highly important for the protection of Experimentalists and others who are intending to solicit Letters Patent for Inventions, that Caveats should be received by the Attorney and Solicitor-General, in order to prevent surreptitious Patents passing the Report; BE it Enacted, that Caveats may

be entered as heretofore, to be in force for one Year, against any Patent passing the Report for a specific object named; and that on entering such Caveat, the Party claiming an Invention shall be bound to deliver a Sealed Packet containing a preparatory Specification or Explanation of the Object to which his Invention or Discovery applies, and a general Description of the Principles or leading features by which he proposes to carry the same into effect, and on which his Invention rests.

Hearing of Caveats.

AND be it further Enacted, that on the presentation of a Petition to the Attorney-General or Solicitor-General, for the grant of Letters Patent for any Invention or Discovery, the Deputy or Clerk of the Office shall give notice in writing of the same to all Parties claiming under Caveats the right to an Invention for a similar object; which Parties shall be at liberty to question (within fifteen Days) the right of such Petitioner, and to demand a hearing before the Attorney-General or the Solicitor-General, and their Board of Scientific Advisers, upon the merits the respective claims, as set out of in the preparatory Specifications of the Petitioner and of the Opponents. And that at such hearing before the Attorney-General or Solicitor-General and his Board of Advisers, the said preparatory Specifications shall be opened, and if it should appear necessary, further information shall be called for from all Parties claiming to be heard; and if the Invention of the Petitioner shall be found not to interfere with those described under the opposing Caveat or Caveats, and no other legal objection exists, the Attorney-General or Solicitor-General shall then sign an approbatory Report to his Majesty, recommending the grant of Letters Patent to the Petitioner; the costs of every such hearing (not exceeding £5. 5s.) to be paid by the opposing party.

Adjudgment of Prior Right.

AND be it further Enacted, that if the Invention of the Petitioner, and that claimed under an opposing Caveat, shall be the

Enacted, by the KING'S most Excellent MAJESTY, by and with the Advice and Consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the Authority of the same, THAT, notwithstanding any Law or Custom to the contrary, His Majesty is hereby empowered to grant Letters Patent for the terms of *Seven Years* or *Fourteen Years*, as is hereafter expressed and enacted, for the sole making, working, exercising, and vending of any new Invention or discovery of a new or improved Machine, Structure, Apparatus, Process, or Product, applicable to any of the Arts or operation in Science, Manufactures, or Agriculture, which shall not be publicly known, or practised in these Kingdoms at the time of granting such Letters Patent; provided that the same be beneficial to the Public, and not mischievous to the State: upon condition that the said Patentee shall particularly describe and ascertain the nature of the said Invention, and in what manner the same is to be performed, by an Instrument in writing under his hand and seal, and cause the same to be inrolled in the High Court of Chancery within a limited time next after the date of the said Letters Patent.

Subjects for which Patents shall be granted.

AND whereas it shall be lawful to grant Letters Patent for any newly contrived Machine, Engine, or Apparatus; and for any Improvements in existing Machines, Engines, or Apparatus; and for any new or improved Combination, Arrangement, or Adaption of Material things, whether Mechanical or Chemical, which shall produce a useful result; and for any new or improved Manufacture, Process, or Mode of Operation, designed for the purpose of accomplishing a beneficial object: provided the same shall not be publicly known or in use in these Kingdoms.

To whom to be granted.

AND whereas it shall be lawful to grant Letters Patent for either of the terms of Years above stated, on Petition to the King's most Excellent Majesty, to any Person or Persons, whether

Subjects of the Realm, or Foreigners residing or domiciled in these Kingdoms, for any such new Invention, Discovery, or Improvement, whether the same has been invented or discovered by the said Petitioner, or was invented abroad, and communicated to him; an affidavit of the facts being made by the Petitioner, and presented with his Petition.

Claiming too much not to annul the whole.

AND whereas it may happen that through ignorance, and without any intention of fraud or deception, a Patentee may include in his Specification as new, certain parts of a Machine, Structure, Improvement, Process, or Product, which may have been used, or partially known, in these Kingdoms before the Grant of the said Letters Patent; let it be enacted that such part or parts of the Specification being bad, shall not vitiate the whole, but that the Patentee shall lose all exclusive right to such known parts, yet retain those parts which are new. AND whereas it may happen that the said Invention or Discovery, or certain Parts of the same, may have been, either privately, or in an imperfect manner, employed in some parts of these Kingdoms; BE it Enacted, that if the same shall not have been in public use, within Ten Years from the Date of the said Letters Patent, that such knowledge or use of the Invention shall not invalidate the said Patent Right, in the whole or in part.

Preparatory Specification.

AND be it further Enacted, That the said Petitioner shall make a short description of his Invention, to be called a "Preparatory Specification," which shall contain an outline or sketch of his said Invention; and that he shall deliver the said Preparatory Specification, sealed up with the said Petition, at the Office of the Secretary of State for the Home Department, and thereupon paying the Fee hereinafter required.

Report of the Attorney-General or Solicitor-General.

AND be it further Enacted, that the said Petition and the said Preparatory Specification, so sealed up aforesaid, shall be

The Specification to be examined and certified.

AND be it further Enacted, that such Specification shall be examined by the Attorney-General, or Solicitor-General and his Board of Advisers, and if in their Opinion found not to accord with the preparatory Specification, or not to be sufficiently explanatory, the Patentee, or his Representative, shall be forthwith called upon to attend the Board, and explain, or deliver, within Fifteen Days from the Summons, such further Information as may be required, or, in Default of which, to abide by the Consequences of such want of Accordance, or Insufficiency; and when the same shall be found to accord with the preparatory Specification, and to comply in all particulars with the Proviso in the Grant, and not otherwise, the same shall be approved and certified by the Members of the Board, by whom it has been examined, and by the Attorney-General or Solicitor-General, as a good and sufficient Specification of the said Invention or Discovery, and of all things claimed under the said Patent, and that the sufficiency of the said Specification (if so certified) shall not be afterwards questioned in any Court of Law or Equity. And that the said preparatory Specification and ultimate Specification, whether so certified or not, shall be appended together, and by the proper Officer of the Attorney-General or Solicitor-General shall be Inrolled in Chancery within one Calendar Month from the date of depositing such ultimate Specification for Examination, and shall then and there be open to public inspection as other Records usually are, and that the Patentee, or his Representative, shall be called upon to pay the sum of five guineas for every such Examination or Hearing before the Attorney-General or Solicitor-General, before the Certificate is given, and that he shall be liable in law for the customary costs and charges of Inrolling the same in Chancery.

To deposit a Model if necessary.

AND whereas there is often great difficulty in giving a full Description of an Invention, by which it can be readily performed

or made either by a written Account or Drawings thereof: BE it further Enacted, that it shall be lawful for the Patentee, in addition to his written Description and Drawings, to deposit a Model or Pattern of his Invention, if he shall see fit, in some Public Building, within a stated time, to be named by the Attorney-General in his Report or Bill, and that the said Model or Pattern may be produced or given in evidence by any person whatever in any Court of Law or Equity.

To correct Specification, and insert Improvements.

AND whereas it often happens that Omissions are accidentally or unintentionally made in the Specification of an invention: AND whereas it often happens that the Patentee discovers some improvement upon the subject for which the Letters Patent have been granted, and he is deterred by the great expense thereof from taking out new Letters Patent for the said Improvement, which is often lost to the Public; BE it Enacted, That it shall be lawful for the said Patentee to make a Specification or Specifications supplying those Omissions or including those Improvements, which, by Petition to the King, shall be referred to the Attorney-General, or Solicitor-General and his Board of Advisers, to try them, examined in the same way, and subjected to the same conditions as the first Petition; and if in the Judgment of the Attorney-General or Solicitor-General and their Board of Advisers, the said Specification shall appear to accord with the general features, and to form a necessary part of the subject described in the former Specifications, and provided that no similar Invention be claimed under a Caveat, the Members of the Consulting Board and the Attorney-General or Solicitor-General shall certify their approval of the same, and order that the Specification be inrolled within one month from the time of depositing the Petition, and that the Invention described in the same do form part of the original Letters Patent, and be subject to the like conditions, the costs of which examination and inrolment are to be paid as before directed.

same, or interfering with each other, in the opinion of the Attorney-General or the Solicitor-General, and their Board of Advisers ; that then the Attorney-General or Solicitor-General shall call further Evidence, in order to determine to which of the Parties a priority of right shall be adjudged as to the whole or to certain parts of the Invention ; and he shall be empowered to determine to whom the right of Letters Patent shall be granted for any part or the whole of the said Invention ; and the Attorney or Solicitor-General shall order the costs of such hearing to be paid by either or both parties, as he shall see fit.

Costs of Letters Patent.

AND whereas the very great expense of obtaining Letters Patent for the protection of an Invention or Discovery, according to the existing routine of Offices and Stamp Duties, being such as to operate severely upon the industry and ingenuity of the Country ; BE it Enacted, That the Fees payable at the Offices of the Secretary of State, the Attorney-General or Solicitor-General, the Signet Office, the Privy Seal Office, and the Great Seal Office, shall be and the same is hereby reduced to the sum of Sixty pounds ; when the Letters Patent are granted for the term of *Fourteen Years*, and that the said Expenses shall be reduced to the sum of Thirty pounds, when the Letters Patent are granted for the term of *Seven Years* ; and that the Stamp Duties upon the same be reduced accordingly, and included in those sums.

To extend to Scotland and Ireland.

AND whereas the Costs and Expenses of obtaining Letters Patent are unnecessarily increased when taken out for Scotland and Ireland by the Patentee of an Invention for England ; BE it further Enacted, That an Inventor who has obtained Letters Patent for England may have Certificates of the grant of the same, which shall be lodged with the Attorney-General or Solicitor-General for Ireland, or the Lord Advocate for Scotland ; and if no Caveats are entered or opposition made, then the said Attorney-General or Solicitor-General for Ireland, or the Lord

Advocate for Scotland, may at the end of *Fifteen Days* from the depositing of the Petition, report the same, and make out the Bill in the usual manner for the grant of Letters Patent in Scotland or Ireland, but the Sign Manual of his Majesty is hereby dispensed with as far as it has been required in the granting such Letters Patent for Scotland or Ireland. And the Seal appointed by the Treaty of Union in Scotland and the Great Seal of Ireland shall be forthwith appended to the said Letters Patent, the whole charge of fees and stamps for the same in each country respectively not exceeding £20.

To deposit a Specification of Particulars.

AND whereas the grant of Letters Patent, giving an exclusive monopoly to the Patentee, his Heirs, or Assigns, to make, exercise, and vend the said Invention for a limited Term of Years, it is expedient that, after the expiration of the said Term, the Public should have the benefit of the Invention or Discovery, with full liberty to make, exercise, and vend the same: BE it therefore Enacted, That the grant of such Letters Patent shall contain a Proviso that the Patentee shall prepare, or cause to be prepared, an Instrument in Writing, (accompanied with Drawings, if necessary,) containing a full and particular Description of the said Invention or Discovery, and of all things claimed and intended to be secured by the said Letters Patent, and in what manner the same is to be performed, to the best of his knowledge and belief; AND that he, the Patentee, or his Representative, by Power of Attorney duly authorised, or his Executors or Administrators, in case of Death, shall sign, seal, and deliver the said Instrument as the Specification of the said Invention or Discovery, before Two credible attesting Witnesses, and cause the same to be deposited for Enrolment with the proper Officer appointed to receive the same, by the Attorney-General or Solicitor-General, within the Term of Calendar Months, as directed in the said Proviso; and in default of compliance with the said Proviso, the said Letters Patent shall cease, determine, and become void.

Assignment of Interest.

AND whereas the Property in Letters Patent is unnecessarily abridged, without any corresponding advantage to the Public : BE it Enacted, that the Person or Persons to whom Letters Patent may have been granted, shall be at liberty to assign or transfer his or their interest in Letters Patent, or grant Licenses to make or use the same in and manner or to any number of persons he or they may think best for his or their own advantage.

Extension of the Grant.

AND whereas it sometimes happens that Patentees do not derive an adequate Profit from their Inventions during the Fourteen Years for which the Letters Patent have been granted : AND whereas there is no remedy but by an Act of Parliament, to enlarge the Term for which they were granted : BE it Enacted, That at any time exceeding one year before the Term is expired, the Patentee, or his Assigns, may, upon showing that he or they have not been enabled fully to carry the same Invention into effect, or to derive a reasonable Profit from the same, obtain by Petition a Patent to extend the Term ; and His Majesty is hereby authorized and empowered to grant Letters Patent of Extension, in the same manner as other Letters Patent for Inventions are to be granted ; but the Attorney-General shall, with the assistance of the Examiners aforesaid, report upon the fitness thereof, and the terms upon which they ought to be granted, and all costs and expenses of making the necessary Report shall be paid and discharged by the Persons obtaining the said Letters Patent for an extension of the Term.

Injunction to stay a Piracy.

AND whereas great Delay, Inconvenience, and Expense have arisen in consequence of a Patentee being often obliged to sue in a Court of Equity, whilst he has a Suit depending in a Court of

Common Law : BE it Enacted, That the Plaintiff to a Suit in a Common Law Court may, by Motion in that Court, or from a Judge thereof, obtain an Order to stay the Defendant from making or using the Invention, unless an account be kept of the sale or use thereof, and also may obtain an Order to inspect the thing supposed to be a piracy of the Invention.

To change the Venue in Suit.

AND be it further Enacted, That the Venue in any Action may be changed, on Motion to the Court, to the County in which the Witnesses reside, upon both parties approving the same.

To Summons competent Juries.

AND be it further Enacted, That either Party may obtain an Order of the Court, that the Sheriff do return, amongst the Special Jurors to serve on the Trial, Twelve Men practically skilled in the Arts and Sciences, and that each Party shall be at liberty to challenge *Six* of them ; and either Party may obtain an Order that the said Jurors may examine the Drawings and Models at least *Two* days before the day of the Trial

Assessment of Damages.

AND be it further Enacted, That every Defendant against whom a Verdict shall pass for the Infringement of a Patent, shall pay *Three* times the amount of the Damages suffered by the Patentee, as it may appear by the proofs of the Patentee, or by the Account rendered as aforesaid by the Infringer.

Cancelling Letters Patent

AND whereas Actions at Law may be brought upon Letters Patent after the Patentee has been unsuccessful in one Action, and has had a Verdict recorded against him : AND whereas the present mode of Cancelling Letters Patent for Inventions by Scire

Facias is dilatory and expensive ; BE it Enacted, That if the Defendant in an Action on Letters Patent obtain a Verdict, which is not set aside by the Court in which the Action be depending, then the Defendant shall be at liberty to apply to the said Court for a Certificate, that the said Letters Patent ought to be cancelled ; and the said Court is hereby empowered, on Motion to them made, if they think fit so to do, to grant a Certificate that the same ought to be cancelled, and the said Defendant may take the said Certificate to the Lord Chancellor, to whom it shall be a sufficient authority that the said Letters Patent be by him cancelled.

When this Act to come into force.

AND be it further Enacted, That this Act shall come into force and take effect, as to the mode of obtaining Letters Patent, from the *First day of November in the year of our Lord One thousand eight hundred and thirty-three* ; and that all the provisions therein contained, shall, as far as they can, apply to all Letters Patent then in force, as well as to all Letters Patent then and thereafter to be granted.

To extend to Scotland and Ireland.

AND be it further Enacted, That this Act shall extend to Scotland and Ireland.



LITERARY NOTICES.

Tables for planting and valuing Underwood and Woodland, &c. &c. By Mr. R. HORTON. 12mo. London : Longman and Co.

WE have recently had the pleasure of perusing some very useful tables on the planting and valuing of underwood and woodland, or growing timber, drawn up by Mr. Richard Horton, who we believe is a practical surveyor. Such tables have long been wanting, as considerable difficulty has hitherto arisen in ascertaining the number of seeds, plants, or trees, required to cover a given quantity of land, and also to form a fair and correct estimate, or valuation of growing underwood, or young timber.

To the land steward, surveyor, planter, or land owner these tables must prove of great assistance, as at one view he can find how many seeds, plants, or trees it will take to cover any given quantity of land, at any required distance between each plant ; also, by these tables can be seen the estimated value of growing underwood of any age, with or without regard to the price it sold for at the last falling.

In this little work Mr. Horton has also added some other useful tables, particularly for converting customary meadow into statute, or from one denomination to another.

New Patents

SEALED IN ENGLAND.

1833

To Henry William Nunn, of the parish of Whippingham, in the Isle of Wight, bobbin net lace manufacturer; George Mowbray, of the same place; and Richard Alabone, of the town of Newport, in the said Isle of Wight, foreman to the said Henry William Nunn, for their invention of certain improvements in the machinery used in the manufacture of bobbin net lace, for producing certain kinds of embroidered or ornamented lace.—Sealed 27th February—to be inrolled within 6 months.

To Charles Jones, of Birmingham, in the county of Warwick, gun-maker, for an invention of certain improvements upon percussion locks applicable to fire arms.—Sealed 7th March—6 months for inrolment.

To John Springall, of Oulton, in the county of Suffolk, iron-founder, for his invention of an improved corn stack stand.—Sealed 7th March—2 months for inrolment.

To Thomas Don, of Lower James-street, Golden-square, in the city of Westminster, millwright and engineer, for certain improvements in machinery for the

preparation of farinaceous substances, and in the processes of making bread, portion of which improvements were communicated to him by a foreigner residing abroad.—Sealed 8th March—6 months for enrolment.

To William Henson, of the city of Worcester, lace manufacturer, for his invention of certain improvements in machinery for manufacturing lace, commonly called bobbin net lace—Sealed 14th March—6 months for enrolment.

To Miles Berry, of 66, Chancery-lane, in the county of Middlesex, mechanical draftsman, and patent agent, for an improvement or improvements in the making or constructing of gas meters, being a communication from a foreigner residing abroad—Sealed 19th March—6 months for enrolment.

To William Herbert, of Nottingham Park, in the county of Nottingham, lace manufacturer, for his invention of certain improvements applicable to that class of machinery commonly called or known by the name of warp machinery, employed for the manufacture of lace and other fabrics—Sealed 21st March—6 months for enrolment

CELESTIAL PHENOMENA, FOR APRIL, 1833.

D.	H.	M.		D.	H.	M.	
1	0	0	Clock before the Sun 3 m. 58 s.	16	0	0	☉ in conj. with ♄
—	—	—	Sun rises 5 h. 39 m. sets 6 h. 31.	18	11	41	☽ in conj. with ♃ long. 16.
—	—	—	Moon rises 2 h. 22 m. p.m. sets	—	—	—	☽ lat. 5. 0. S. Jupiter lat.
—	—	—	4 h. 35 m. A. M.	—	—	—	1. 5. S. diff. of lat. 6. 5.
—	—	—	Moon passes the meridian 9h.	19	2	9	☽ in conj. with ♄ long. 23. ☽
—	—	—	48 m.	—	—	—	lat. 5. 0. S. ☽ lat. 0. 57. N.
4	0	0	Sun in conj. with Jupiter.	—	—	—	diff. of lat. 5. 57.
19	0	0	Moon in perigee.	19	20	39	☉ enters Taurus.
2	15	50	☽ in conj. with ♃ long 173.	20	0	0	☉ Clock after the ☉ 1 m. 8 s.
—	—	—	☽ lat. 4.55. N. ♃ lat. 2. 28.	—	—	—	☉ rises 4h. 56m. sets 7 h. 3 m.
—	—	—	N. diff. of lat. 2. 27.	—	—	—	☽ rises 5h. 39 m. A. M. sets
4	2	40	Ecliptic opposition or ☉ full	—	—	—	7 h. 28 m. P. M.
—	—	—	moon.	—	—	—	☽ passes mer. 0 h. 27 m.
5	0	0	♄ Stationary.	1	4	—	Ecliptic conj. or ☉ new moon.
—	—	—	Clock before the Sun 2 m. 46 s.	21	19	40	Georg. passes the meridian.
—	—	—	☉ rises 5 h. 29 m. sets 6 h.	22	4	40	☽ in conj. with ♀ long. 61. ☽
—	—	—	38 m.	—	—	—	lat. 3. 39. S. ♀ lat. 5. 39.
—	—	—	☽ rises 7 h. 51 m. P. M. sets	—	—	—	N. diff. lat. 9. 18.
—	—	—	6 h. 17 m. A. M.	23	0	0	Mer. R. A. 1 h. 19 m. dec.
—	—	—	☽ passes the mer. 13h. 19m.	—	—	—	8. 8. N.
7	0	0	Mer. R. A. 1 h. 48 m. dec.	—	—	—	Venus R. A. 4 h. 4 m. dec.
—	—	—	14. 34. N.	—	—	—	26. 34. N.
—	—	—	Ven. R. A. 3 h. 40 m. dec.	—	—	—	Mars R. A. 6 h. 39 m. dec.
—	—	—	24. 53. N.	—	—	—	24. 52. N.
—	—	—	Mars R. A. 5 h. 59 m. dec.	—	—	—	Jupiter R. A. 1 h. 3 m. dec.
—	—	—	25. 16. N.	—	—	—	5. 34. N.
—	—	—	Jup. R. A. 0 h. 50 m. dec.	—	—	—	Saturn R. A. 11 h. 35 m. dec.
—	—	—	4. 11. N.	—	—	—	5. 24. N.
—	—	—	Sat. R. A. 11 h. 38 m. dec.	—	—	—	Georg. R. A. 21 h. 30 m. dec.
—	—	—	5. 3 N.	—	—	—	14. 49. S.
—	—	—	Georg. R. A. 21 h. 37 m. dec.	—	—	—	Vesta R. A. 19 h. 13 m. dec.
—	—	—	14. 59. S.	—	—	—	18. 45. S.
—	—	—	Vesta R. A. 18 h 56. m. dec.	—	—	—	Juno R. A. 15 h. 23 m. dec.
—	—	—	18. 54. S.	—	—	—	3. 15. S.
—	—	—	Juno R. A. 15 h. 33 m. dec.	—	—	—	Pallas R. A. 2 h. 33 m. dec.
—	—	—	4. 56 S.	—	—	—	3. 56. S.
—	—	—	Pallas R. A. 2 h. 5 m. dec.	—	—	—	Ceres R. A. 4 h. 9 m. dec.
—	—	—	5. 22. S.	—	—	—	20. 17. N.
—	—	—	Ceres R. A. 3 h. 44 m. dec.	24	19	18	☽ in conj. with ♄ long. 99. ☽
—	—	—	18. 28. N.	—	—	—	lat. 28 S. ♄ lat. 41 N. diff.
10	0	0	Clock before the ☉ 1 m. 20 s.	—	—	—	lat. 2. 9.
—	—	—	☉ rises 5 h. 18 m. sets 6h. 46 m.	25	0	0	☉ Stationary.
—	—	—	☽ rises 0 h. 41 m. A. M. sets	—	—	—	Clock after the ☉ 2 m. 8 sec.
—	—	—	8 h. 51 m. A. M.	—	—	—	☉ rises 4h. 46m sets 7 h. 11 m.
—	—	—	☽ passes mer. 17 h. 36 m.	—	—	—	☽ rises 8 h. 32 m. A. M. sets
12	0	7	☽ in ☐ or last quarter.	—	—	—	0 h. 15 m. A. M.
13	2	26	☽ passes the meridian	4	33	♄	passes the meridian.
13	13	0	♄ passes the meridian.	22	52	☽	passes the meridian.
13	15	0	☽ in Apogee.	27	5	34	☽ in ☐ or first quarter.
14	0	0	half Axes } 44. 46.	29	0	0	♄ Stationary.
—	—	—	Jupiter's ring } 0. 26.	29	21	0	☽ in conj. with ♃ long. 172.
15	0	0	Clock before the ☉ 0 m. 1 sec.	—	—	—	☽ lat. 4. 31. N. ☽ lat. 2.
—	—	—	☉ rises 5 h. 7 m. sets 6 h.	—	—	—	25. N. diff. of lat. 2. 6.
—	—	—	54 m.	30	0	0	half Axes } 43. 59.
—	—	—	☽ rises 3 h. 58 m. A. M. sets	—	—	—	Jupiter's ring } 0. 0.
—	—	—	1 h. 43 m. P. M.	—	—	—	Eclipses of Jupiter's Satellites are not
—	—	—	☽ passes the meridian 21h. 30m	—	—	—	visible this month.

METEOROLOGICAL JOURNAL,
FOR FEBRUARY AND MARCH, 1833.

1833.	Thermo.		Barometer.		Rain in in- ches.	1833.	Thermo.		Barometer.		Rain in in- ches.
	Hig.	Low	Hig.	Low.			Hig.	Low	Hig.	Low.	
Feb.						March.					
26	50	33	29,34	29,24	,15	12	41	28	29,94	29,87	
27	47	36	29,12	29,06	,05	13	39	23	29,78	29,48	
28	45	27	29,29	28,85	,025	14	39	18	29,68	29,54	
March											
1	45	29	29,26	29,04	,15	15	40	26	29,60	29,52	
2	49	29	29,74	29,61		16	49	27	29,50	29,46	
3	53	31	29,69	29,64		17	48	29	29,54	29,46	
4	53	39	29,74	29,64		18	42	32	29,73	29,56	,125
5	51	27	29,98	29,86		19	42	31	29,93	29,81	,275
6	43	37	30,04	30,00	,025	20	43	26	30,06	30,00	
7	45	30	30,19	30,09		21	42	29	29,97	29,85	
8	38	26	30,20	Staty.		22	39	25	29,89	29,80	
9	39	26	30,17	30,06		23	39	24	29,80	29,74	
10	39	30	29,91	29,87		24	40	27	29,78	29,72	
11	43	29	29,95	29,91		25	43	29	29,79	29,74	,025

The Annual Meteorological Tables will appear next Month.

Edmonton.

CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.

Longitude 3 51 West of Greenwich.

at the same time presenting their broad surfaces to the water in the act of propelling.

The Patentees have appended to their specification, a perspective drawing, representing the complete wheel in operation, which is shown in Plate XII. fig. 15.

The wheel is proposed to be about ten feet in diameter, and five in breadth, having sixteen paddles, or half paddles, for, when closed in the propelling position, they are only equal to eight; but the number of paddles must be increased or decreased according to the diameter of the wheels, or the depth they are intended to work in the water, as they are calculated to work at any depth; or if even the whole wheel were immersed, they would have the same power of propelling as if only partially immersed.

The paddle marked *a*, *a*, are those supposed to be immersed in the water, and in a propelling position, and the paddles *b*, are in the act of closing; and all the other paddles *c*, *c*, *c*, have their edges standing vertically in planes, parallel to the rim of the wheel. When the wheel is put in motion, the paddles *b*, will assume the positions shown at *a*, while the paddles *a*, will pass into the positions shown at *c*, with their edges vertical and planes parallel to the rim, by which means they are enabled to discharge the water in rising, which otherwise would hinder the propelling power and progress of the vessel; this contrivance also prevents the swell caused by the common paddles. As the wheel revolves, the paddles *c*, *c*, assume the positions shown at *b*, and so on in succession.

When it is found necessary to turn the wheel the contrary way, then all the paddles perform a counter revolution, and take the same positions for propelling a vessel backwards, as they had done to propel it forwards, as they work equally well either way.

The wheels are attached to the side of the vessel by the axle passing through, in the same manner as the common propellers, or they may be immersed under water, or in any other direction that may be thought best.

The Patentees explain the parts of the paddles and the movements, which they claim as their invention in these words. " Each half paddle turns upon its axis parallel to the arms of the wheel in two cross bars, which are fastened to opposite arms; it also passes through another bar, which is fixed about a foot from the axis of the wheel, and which is broad enough to join and screw to the next bar, so as to form, when completed, an octagon about the axle of the wheel, (as shown detached in fig. 16), which is a section of the wheel. The bars are bolted and screwed to the arms, and also to the bosses *d*, as seen in fig. 15.

" The shaft of the paddle having passed through the above bar, has a crank fastened to its end of three inches radius, but must be increased or decreased, according to the diameter of the wheels. The end of the crank is of a globular shape of three inches diameter, and which is made to move in a groove, (as may be seen in the section, fig. 16, and marked *e, e,*); the groove is made in a round boss or collar, formed for the purpose, and in the form of the diagram, fig. 17.

" The two bosses so constructed for each paddle are fastened on a tube *f*, in the section, which tube commences at the inner side of the boss of the wheel, marked *d*, in fig. 15, and passes through the opposite boss about three inches; to which tube a catch is fixed, to correspond with a like catch fixed to the inside of the frame in which the wheel works.

" The use of the catch is to hold the tube stationary, on which the two grooved bosses, or collars, are fixed; so that when the wheel is put in motion the tube remains

fixed. The cranks on the ends of the paddle shafts revolved with the wheels, and the globular part formed on the end of each being in the grooves of the bosses or collars fixed on the tube, will cause the cranks to turn obliquely, by passing in the grooves from 1 to 2 (see fig. 17); for, while the end of the crank is in the part of the groove marked 1, the paddles are vertical, and their planes parallel to the rim of the wheel; but when the ends of the cranks pass into the part of the groove seen at 2, then the paddles will be placed at right angles to the position before named, and in a propelling position.

“ By the passage of the cranks in the grooves before described, and which is caused by the revolution of the wheel, the position of the paddles are changed with greater felicity. If the wheel be made to turn the contrary way to what we are now supposing, the catch upon the tube turns with the wheels, till it meets the catch on the frame, immediately the paddles are put in motion, and act in the same manner for propelling as when turned the other way.

“ The axle, marked *g*, in the section, fig. 16, is fixed firmly in that boss next to the vessel's side, and passing through the tube rests upon the outer frame.

“ The paddles and shafts may be of metal, or partly of metal and partly of wood, according to the power they have to resist. The paddles rest when in the water against the arms of the wheels, and also a stay in the middle of the cross bars.

“ It will be necessary to brace the wheels from one cross bar to the other when strength is wanted, but which brace forming no part of our invention, is omitted in the drawing.

“ The diagram, fig. 17, represents the race of the groove, as if the groove were placed round the boss upon the tube, and we fix a small roller in two of the angles of

the oblique part of the groove, which will cause the paddles to work better. When the motion is changed, for the purpose of propelling backwards, the place of these rollers is seen in the diagram.

“ And we further declare, that our invention consists in so constructing and combining the paddles of the wheel with the cranks and grooved collars, or bosses, shown above, as to cause them to rise in a vertical plane parallel to the sides of the wheel, after performing their office of propelling, and again adapt themselves in succession every time the wheel revolves to the performance of that office. —[*Inrolled in the Petty Box Office, February, 1829.*]

To THOMAS BONSOR CROMPTON, of Tamworth, in the county of Lancaster, Paper Maker. and ENOCH TAYLOR, of Marsden, in the county of York, Millwright, for their invention of certain improvements in that part of the process of paper-making which relates to the cutting.—[Sealed 13th May, 1828.]

THIS invention applies to the cutting of paper made in those machines which produce perpetual, or what is called endless sheets that is uninterrupted lengths of paper, from a traversing endless web ; instead of distinct sheets made by hand in small moulds ; which endless paper requires to be cut into suitable portions as sheets of the ordinary size, and it is for this purpose that the present improved machinery is designed.

From some of the paper-making machines above alluded to, the endless paper, in its wet state, is passed over hot cylinders between felts, for the purpose of being dried (see Crompton's Patent, Vol. II, page 253, of our First Series), and is either folded upon a reel to the proper size, and cut afterwards in the folds in a distinct machine, so as to form sheets ; or a peculiar construction of shears, is adapted to the drying machine, and it is by

their action cut transversely into sheets as it passes ; but in both these instances the paper is cut transversely, and forms sheets of the whole breadth of the machine. As, however, it is found to be desirable to cut the paper into smaller portions, as sheets of the size of post paper, foolscap, &c. the present invention is a machine for cutting the paper lengthwise, in order to divide it longitudinally into two lengths of half the original breadth.

The machine is represented in Plate XII. at fig. 11, which is a side view ; *a*, is a roller on which the paper is supposed to be wound, either in a damp state from the making machine, or in a dry state from the drying machine ; the paper is represented by the line *p, p*, and extends to the receiving roller *b*, on which it is to be wound after having undergone the process of cutting longitudinally ; *c, d*, and *e, f*, are two pair of drawing rollers, which may be made either of wood or metal ; the upper rollers, *c*, and *e*, have pullies on their axis for driving bands ; *g*, and *h*, are two circular blades, which constitute the cutters, and it will be seen they intersect each other in the line of the paper.

The upper roller *g*, has a driving pulley on its axis to which the first motion is communicated ; and the axis *r*, of the lower circular blade *h*, is thrown a little out of the perpendicular of the bearing at this side of the machine, which is done for the purpose of opening the back edges of the blades to make the delivery of the paper more free ; while it closes the front edges and makes them act better against each other, and cut the paper more sharply. The weights, *v, v, v*, are merely friction weights.

The manner of giving motion to the rollers, is as follows,—*k*, is the shaft or axis of the upper blade *g*, of the cutter, and to this the power, whether steam or other-

wise, is applied. On the end of this shaft there is a pulley, and also on the ends of the rollers, *c*, and *e*, which, by means of the bands *m*, and *n*, are driven from the shaft *k*.

There is also a band from the pulley of the roller *e*, to a friction pulley on the roller *b*, for the purpose of driving it, and which, as the thickness of the paper increases, requires the friction pulley to slide or slip upon its axis, to prevent the paper tearing by its accumulation upon the roller; this roller is called the receiving roller.

It should be stated, that wherever the rollers are in pairs, as at *c*, *d*, and *e*, *f*, the under ones are driven by spur gear, at the opposite ends to those shown, as will be seen by reference to the next figure, and the under cutter *h*, is in like manner driven from the cutter *g*. Fig. 12, is a view of the opposite side of the machine, to that exhibited in the preceding, and shows the spur gear before alluded to.

The rollers *e*, *f*, should be driven at the same speed as the rollers *c*, *d*, so as to keep the paper uniformly tight.

Fig. 13, is a plan or horizontal view of the invention; *l*, is a sliding boss with an adjusting screw, to which boss the upper circular cutting blade is screwed; *g*, is the steel cutting blade, and the machine being here represented in the act of cutting the paper, of course the lower blade of the cutter will be underneath, and is, therefore, represented by dotted lines; this figure shows at *r*, the necessary angle at which it is required to place the shafts of the cutters, and by this arrangement it will be seen that the back of the blades at *s*, just run free of each other, while at *t*, they touch each other; *w*, represents the longitudinal cut in the paper.

Fig. 14, is a separate view of the upper and lower blade of the cutter; *g* is the upper, and *h*, is the lower blade, which are screwed on the sliding bosses *l*, *x*. These

bosses have adjusting screws for the purpose of setting the blades nearer together when necessary ; the blades have square or acute edges, and cut by their action against each other.

It is only necessary further to state, with reference to the general action of the machine, that motion being given to the shaft *k*, of the cutter *g*, the drawing rollers *c*, *d*, draw the paper from the feeding roller *a*, which is kept from delivering it too freely by the friction weight *v* ; at the same time the second pair of drawing rollers *e*, *f*, moving at the same speed as *c*, *d*, stretch the paper tightly for the cutter to act upon, while the roller *b*, winds it up, as it is cut.

The above is an explanation of the invention, as it is to be practised when used in a separate and independent state from the other processes of paper-making, but the invention may be also applied to the other machinery used in paper-making with very slight alterations.

Thus, for example, if the machine above described, is applied beyond the dry pressing rollers, or to the winding reel, commonly used and well known to paper-makers, it will be obvious, that the roller *a*, may be left out of the machine, and that the paper may pass at once to the rollers *c*, *d*, by speeding the motion of the cutting-machine exactly to the velocity with which the paper is produced ; and likewise the paper when cut longitudinally may pass directly to another machine, or into sheets instead of winding round the roller *b* ; and in this the roller *b*, may be taken away or omitted in constructing the machine, without altering or affecting the material parts ; which are the rollers *c*, *d*, and *e*, *f*, and all that is contained between, as described above.—[*Inrolled at the Inrolment Office, July, 1828.*]

To RICHARD HALL, of Plymouth, in the County of Devon, Tailor and Woollen Draper, for his having invented a Composition applicable to certain fabrics, or substances, from which may be manufactured boots, shoes, and various other articles. [Sealed 10th March, 1829.

THE subject of this patent is intended to be an artificial leather made by coating cloth, or any other fit substance as a basis, with a composition consisting of caoutchouc, (Indian rubber) with wax, resin, and blacking, melted and mixed together.

The composition is to be made by combining the following proportions of materials:—About one pound of bees wax, half a pound of caoutchouc and a quarter of a pound of rosin; which are to be coloured by half a pound of ivory black and a quarter of a pound of lamp black; but though these proportions have been found to answer the purpose well, they need not be strictly adhered to. These matters are to be melted together in a suitable vessel, and if we understand the patentee correctly, the composition is to be kept hot by standing over a vessel of boiling water.

The cloth intended to be coated is to be distended, and then the composition laid upon it with a brush and sufficiently rubbed on in the first instance to make it enter into the fibres and interstices of the cloth or other material. It will be necessary to put several coatings of the composition on the face of the cloth in order to give it sufficient substance, and to harden it between each coating in a drying chamber. There are however no particular directions as to the mode by which the composition is rendered hard, which as respects the melted caoutchouc cannot be effected simply by a warm atmosphere.

Instead of the above materials, spermaceti, naphtha, or turpentine may be employed in place of the bees wax, and for the resinous material frankincense, asphaltum, or bitumin may be adopted. For the colouring matter any opaque substance may be employed, which shall be found to give the desired hue, either of black or any other colour, and when the composition is dry it may be cut into suitable shapes and made up into boots and shoes.—[Inrolled in the Inrolment Office, September, 1828.

A patent was granted in 1824 to Mr. Thomas Hancock, for making artificial leather from caoutchouc spread upon cloth. (see the Xth vol. of our First Series, p. 22.

THE
London
JOURNAL OF ARTS AND SCIENCES,
AND
REPERTORY
PATENT INVENTIONS.

No. XV.
CONJOINED SERIES

Recent Patents



To WILLIAM CHURCH, of Bordsley Green, near Birmingham, in the county of Warwick, gentleman, for his invention of certain improvements in machinery for making nails.—[Sealed 25th February, 1832.]

THIS invention of certain improvements in machinery for making nails, consists, first, in making, forming, and preparing the nail from rods, bars, or plates of iron, or other ductile metals, or alloys of metals. Secondly, in machinery or apparatus for converting such metal rods, or rods other-

wise prepared, into nails. Thirdly, in machinery or apparatus for making that kind or description of nail for which a Patent was granted by his present Majesty to Richard Prosser, of Birmingham, on the 13th day of July, 1831. (a description of which will be found in Vol. VIII. Second Series of the London Journal, page 29.) The Patentee describes the particulars of his invention as follows :—

My method of making the rods from which the nails are to be formed, consists in preparing bar or plate iron, or other metal, by passing it through pressing rollers having indentations upon the peripheries of one or both of them, so as to form the bar or plate of metal into the required shape for the rods, which plates or bars may afterwards be separated into rods of any desired width by common slitting rollers.

Figs. 1 and 2, in Plate XV, represent a pair of rollers, which are of a similar construction to those ordinarily used for rolling flat bar iron, but having a part of the periphery of one of the rollers indented and formed into projections and curved surfaces *a, a*, whose radii or distances from the axis of the roller are unequal.

Figs. 3 and 4, represent horizontal and side views of a piece of plate iron or other metal after it has been passed between the indented and cylindrical rollers. The metallic plates or bars thus prepared, are separated into nail rods, as shown in fig. 3, where the plates are represented as being partly slit by means of ordinary slitting rollers. After the operations of rolling and slitting above described, it will be perceived the nail rods consist of a series of wedge formed pieces *l, l, l*, as shown in fig. 4, each wedge piece being intended to form a nail when finished. The principal object of rolling the rods into wedge formed pieces, is to measure out a due quantity of metal proportioned to the required thickness or strength of the

nail in its several parts, and which quantity depends upon the form that it may be thought expedient to give to the projections and indentations upon the peripheries of the roller or rollers.

My machinery or apparatus for converting rods of metal into nails, consists of three machines for effecting this object in different ways; and as each machine admits of variations in the arrangement or detail of its parts, I shall describe the machines separately, and state some different dispositions of the working or operative parts. The first machine I shall describe is shown in the several figures 5, 6, 7, 8, 9, 10, in Plate XV.; and its improvements consist, first, in the manner of feeding the nail rod into the machine; second, in the manner or mode of effecting the pointing and cutting off from the rod the piece which is to form the nail; thirdly, in the manner of carrying the blank or shank, when pointed and cut off, to the dies, where it is to be finished in shape, or moulded and headed; fourthly, in the mode or manner of finishing the shape of the shank, and of forming the head of the nail upon it; and, fifthly, in the manner of discharging the nail when finished.

Figs. 5, 6, and 7, are elevations; figs. 8 and 9, are plan views; and fig. 10, is a horizontal section taken through the machine in the direction of the dotted lines A, B, in figs. 5 and 6. The same letters of reference being marked upon corresponding parts in all these figures.

The nail rods 1, 1, with the thin ends of the wedges foremost, are introduced into the machine through a guide of any convenient form, and placed in the situation between the cutters *b, b*, as shown in figs. 5 and 10, after which it will be fed into the machine by the following means:—

On the main shaft *k*, is fixed the cam wheel *s*, which, as it revolves, raises the lever *t*, having its fulcrum in the ear 2, and its underside resting upon the cam wheel. The lever

t, as it rises, carries with it the other lever *u*, to which it is connected by an adjustable joint 3, moving in slots in the levers. The lever *u*, is connected by its fulcrum rod 4, in the standard 5, to the lever *v*, fixed upon the other end of the rod 4. To the lower end of the lever *v*, is connected the piece *w*, its end being formed into a feeder or pusher, which, as it is moved backwards by the movement of the lever *v*, falls into the notches or recesses in the nail rod, and on being moved the reverse way, pushes against the projections or shoulders of the wedge formed parts of the nail rod, and causes them to move severally under the cutters *b, b*, to undergo the operation of pointing and cutting off.

The extent of the movement of the pusher can be regulated through the joint 3, of the levers *t* and *u*; and, after the feeder *w*, has pushed one of the wedge-formed pieces under the cutters, a spring, 6, draws down the levers *t* and *u*, on to a smaller diameter of the cam *s*, and thereby causes the lever *v*, to draw back the feeder *w*, ready to push another portion of the rod under the cutters *b, b*.

In order to form a point to the nail, I remove by means of cutting away a small piece, 7, from one side of the thin end of the wedges 1, 1, 1, as shown in the enlarged figure 12. The piece so cut off forms a shoe bill, and the operation of cutting off the shoe bill, which I call pointing, is performed in the following manner:—The rod being introduced through a guide, and placed between the cutters *b, b*, one of which is fixed in the cutter head *c*, and the other in the bed *d*.

The cutter head *c*, is mounted upon the shaft *e*, and partakes of any motion given to the shaft. At each end of the shaft *e*, on the side opposite to the cutter head, is fixed a short lever *f, f*, (see fig. 6.) and between these levers *f, f*, is a sling *g*, connected to them by pivots *h, h*, (shown in fig. 10); *i*, is an anti-friction roller on the small crank *j*,

at the end of the main shaft κ . This roller i , works in a groove or opening in the sling g , by which means, as the main shaft κ , is made to revolve, the cutter head will rise and fall, and thus effect the operation, the lower cutter in the bed being stationary. These cutters b, b , stand obliquely to the rod, as shown in fig. 12, in order that a triangular piece may be cut out of the wedge piece of the rod, and at this operation the nail should not be entirely separated from the rod, unless an extremely sharp point be required. On the side of the upper cutter b , is another similar cutter l , (see fig. 5,) with its lower or cutting edge placed a little above it.

When the cutter b , has effected its operation, and has been carried down so that the cutter l , almost touches the nail, another small lower cutter n , attached to a cylindrical slide m , situated in the bed d , is driven up by the lever o , which is connected to the before-mentioned shaft e , by the rod p , shown by dotted lines in fig. 6. An adjusting screw 8, in the end of the lever o , regulates the height to which the cutter n , is moved in separating the nail from the rod. The lower cutter n , is stationary while the pointing cut is made. The slide m , which carries the lower cutter n , rests on a shoulder 9, in the cylinder bed-piece d , (see fig. 11.) The piece m , is made in two parts, and furnished with a screw 10, for adjusting the height of the cutter n . After the nail has been separated from the rod by the cutter n , as above described, it is thrust forward through the guide 11, into the carrying plyers r, r , (fig. 5,) by means of the pusher s , on the feeder w , (which receives its motion as before described from the cam wheel s ,) another portion of the rod being at the same time brought forward to be pointed and separated as before. After the nail has been pushed into the carrying plyers r, r , it is there held fast by means of springs x, x, x , pressing against a tail piece 12.

upon the moveable jaw of the plyers (see fig. 5); the carrying plyers are made to perform a portion of a revolution, that is to move from the position of r 1, to that of r 2, and so on by the following means :—

On the main shaft κ , is fixed a toothed wheel A , gearing with the wheel B , attached to the driving wheel C , as seen in fig. 7. The driving wheel C , has a short arm D , carrying a roller Z , which roller is situated in that part of the wheel where a portion of it has been removed, as seen in the figures. The carrying plyers are mounted upon one end of the shaft E , upon the other end is fixed what I call the star wheel F . By the motion of the wheel A , on the main shaft κ , the driving wheel C , is made to revolve, and the roller Z , entering one of the grooves 13 in the star wheel F , turns it one-fourth round, where it is securely held throughout the remainder of the revolution of the driving wheel, by the part between the grooves 13 being in contract with the periphery of the driving wheel C ; and thus while the carrying plyers only perform a portion, the main shaft κ , performs an entire revolution, and thereby the pointed wedge-form pieces, or shanks of the nails are carried successively between the moulding dies G , H , and there held while the operation of moulding and heading is performed. These dies being furnished with adjusting screws 14, 14, by which their proper position may be determined.

The parts of the apparatus for moulding and heading will be best seen in the section in figure 10, where a blank is represented in a position to be operated upon. By the revolution of the main shaft κ , the crank J , through the medium of the connecting rod L , pulls towards it the lever M , which being connected by the bars N , to the moveable die block O , the dies are brought together with sufficient force to shape or finish the shank part of the nail, at the same time holding it firmly, while the heading pin R , is

forced up by the lever *m*, and compressing a part of the shank, forms the head: the heading pin *p*, being furnished with an adjusting screw 20. On the further progress of the crank *j*, the dies recede from each other, and the carrying plyers are again brought into motion by the means before described, and the finished nail carried out of the heading dies and another taken into its place. On the end of the lever *m*, is mounted the anti-friction roller 15, moving upon a short axle 16, and running upon the rail 17, by which means the lever *m*, will be made to move freely and in proper position to the heading dies.

In passing from the station where the nail is headed to the lower station where it is discharged, a tail piece 18, on the jointed end of the moveable jaw of the carrying plyers *r, r*, comes into contact with the fixed pin 19, and moving it outwards, opens the plyers, when the nail is allowed to fall away below. It should here be remarked, that although the carrying plyers should be made thinner than the nail where they rest between the dies while the heading is performed, they should be strengthened on each outer edge.

The second machine for converting rods of metal into nails is shown in these several figs. 13, 14, 15, 16, and 17. Fig. 13, is a plan view of the working parts of the machine for effecting the moulding, heading, and cutting off. Fig. 14, is a front view, and fig. 15, a vertical section; figs. 16, and 17, are plan views of the dies in different positions, the same letter of reference being marked upon corresponding parts in all these figures. In this machine the moulding and finishing of the shank of the nail is obtained by a reciprocating rotatory motion of the moulding dies, instead of the direct pressure in the foregoing machine. The nail rods may be prepared in the manner described under the first head of this specification, or they may be passed through a pair of rollers as shown in figs. 18 and 19.

The indentations upon the peripheries of these rollers will cause the rod to take the form shown at *a, a, a*, fig. 18; that is, with an enlargement on the ends of the wedge-formed pieces, which will assist the operation of heading.

The moulding dies *a, b*, are mounted in the ends of levers *c, d*, turning upon axles *e, f*, as their fulcrums, and are moved by connecting rods *g, g*, and cam wheels *h, h*, upon the main shaft *i, i*; and in order to open the dies (as shown in fig. 16), so as to admit the rod of metal between them, the axle *f*, is mounted in a sliding piece *j*, (shown by dots in fig. 14), moving in guides in the frame work of the machine. To the axle *f*, is connected one of the toggle jointed levers *k, k*, and the other to a pin *l*, fixed in the frame work. The manner of constructing these toggle joint levers is shown best in fig. 14, they being partly removed in the other figures to expose the other parts of the machine. To these toggle levers is connected a bar *m*, actuated by a cam *n*, on the main shaft which draws the bar *m*, and levers *k, k*, towards it to open the dies; and on the nail rod being brought between the dies (as shown in fig. 16), by a proper feeder, or any other convenient means, the cam *n*, pushes back the bar *m*, and the levers *k, k*, into the position shown in fig. 13, and cause the dies *a, b*, to hold the nail rod firmly while the heading is performed. The heading die *o*, is mounted on the end of the short arm of the lever *p*, which turns on an axle at *q*; the other end of this lever *p*, is connected by the coupling piece *r*, to the crank *s*, upon the main shaft *i*. By the rotation of this crank the heading die is brought up against the moulding dies *a, b*, (as shown in figs. 13, and 14), with sufficient force to form the head of the nail, which being completed, the heading die *o*, recedes from out of the way of the dies *a, b*, as they proceed to mould or finish the shaft, which is effected by the cam *h, h*, pushing forward

the bars *g, g*, thereby moving the levers *c, d*, into the position shown in fig. 5, and at the same time pressing or moulding the nail rod into the required form, and completing the shaft of the nail, which may be separated from the rod by the cutter *t*, mounted in the lever *c*, sliding in a groove therein, which is made to cut off the nail from the rod by the cam wheel *u*, pushing forward the bar *v*, connected to the bent lever *w*, having an adjusting screw *x*, pressing upon the vertical cam *y*, of the cutter *t*.

After the nail has been separated from the rod, the bar *m*, and cam *n*, cause the toggle levers *k, k*, to open the dies, when the nail will be at liberty to fall away. The bar *g, g*, and cams *h, h*, bringing the levers *c, d*, and moulding dies *a, b*, into the position shown in fig. 16, and the cam *u*, drawing back the bar *v*, and lever *x*, allows the cutter *t*, to be brought back into its former position by a spring or any other convenient means. The manner of constructing the moulding dies is shown on an enlarged scale in the sectional fig. 20, where it will be perceived that they overlap each other, so as to give the nail the required form; but I do not mean to confine myself to that particular construction, as in some cases the dies may be used without the overlapping parts. An adjusting screw is placed behind the heading die *o*, and wedge formed pieces *z*, in the lever *d*, to adjust the moulding dies, or they may be adjusted in any other convenient manner. The third machine for making nails from rods of metal, is shown in the several figures 21, 22, 23, 24, 25, 26. The operation of moulding and pressing the shank of the nail into the required form in this machine, is obtained by an interrupted rotatory motion of a series of dies placed in a wheel instead of the reciprocating rotatory motion and described above.

Fig. 21, is a plan view of the working parts of the machine, with the moulding dies *a, b*, shown in their position

when holding the nail rod while the heading is performed Fig. 22, is a vertical section of the same. Fig. 23, is a similar view to figure 21, with the dies in the position after the heading and moulding of the shank is performed, and the nail ready to be separated from the rod. Fig. 24, is a section of the same. Fig. 25, is a section, taken in the direction of the dotted lines A, B, in figure 21, and showing the manner of constructing the moulding dies *a, b*, which are mounted in strong plates or wheels *c, d*, fixed upon the shafts *e, f*, and are brought together for holding the nail rod, while the heading is performed, and for pressing or moulding the shank, by means of the toggle jointed levers *k, k*, and cam wheel *n*, and rod *m*, as described in the foregoing machine. The heading die *o*, is mounted in the end of the sliding bar *p*, moving in bearings in the cross pieces *q, q*, of the frame work, and is actuated by a cam wheel *s*, on the main shaft *i*, pressing against a friction roller *r*, on the end of the sliding bar *p*. This manner of working the heading die *o*, shows another mode of performing the heading of the nail; but a lever and crank may be used instead, as in the foregoing machine. The cutter *t*, for separating the nail from the rod, is placed vertically in the framing of the machine, and is actuated by a lever *v*, turning on its fulcrum *u*, on the cross bearer *q*: the short end of this lever is connected to the cutter *t*, its other end having a friction roller *x*, against which the cam *u*, acts, depressing this end of the lever *v*, and raising the short end, and with it the cutter *t*; thereby separating the nail at the time the moulding dies have finished the shank of the nail; after which the cam *u*, ceasing to act upon the friction roller, allows the lever *v*, to be brought into its former position by a spring or weight. It will be seen that the moulding dies *a, b*, are mounted radially in the plates or wheels *c, d*, and on one pair of dies completing a nail, they must move

round a part of a revolution, to allow of the next pair of dies to come into operation. To effect this movement, I give them an interrupted rotatory motion, by means of the star wheel 1, mounted upon the shaft *e*, and which receives its motion from the driving wheel 2, as before described.

The driving wheel is actuated by the toothed wheel 3, which takes its motion from another wheel 4, upon the shaft 5, of the bevel wheel 6, which gears into another bevel wheel 7, upon the main shaft *i*. The shaft *e*, gives the interrupted rotatory motion to the other shaft *f*, by means of the pair of toothed wheels 8 and 9, the teeth of which should gear sufficiently deep one within the other, so as to allow of the shaft *f*, and dies *b*, sliding, to open them without throwing the wheels quite out of gear. It will be observed that the two last described machines are not constructed to make any but what are called chisel-pointed nails, from the moulding dies giving pressure only on two sides of the nail rod. It will also be observed that if the nail rod was passed through a pair of dies where a portion of the point was removed, as described in the first machine, then these machines would be capable of finishing the nail shank into a point; but as it is not always desirable to remove a portion of the rod, the nail, as soon as formed by these machines, may be carried away to another pair of moulding dies, where the nail may undergo a second pressure on the other two sides pressed by the moulding dies, and the point be thereby completed. As there are many ways of conveying the nail from the moulding dies to a second pair of dies, by carrying fingers, spring clips, &c. either sliding or rotating, I have not thought it necessary to describe any particular method, but have shown in fig. 26, one mode of effecting this object. In this figure the moulding dies *a*, *b*, are shown open, and the nail rod in the situation for them to close upon it to form another

nail. The cutting off under these circumstances is not effected until it is placed as there shown, when the cutter *t*, may effect the operation in any convenient way. 1, 2, are a pair of carrying fingers or spring clips, mounted in a bar 3, sliding between the guide arms 4, fixed on the axle 5; this axle has an interrupted rotatory motion communicated to it by a star wheel, or any other convenient manner by which it will bring the carrying finger 1, 2, alternately opposite the nail as it is delivered from the moulding dies *a*, *b*. Upon the back of the bar 3, are two studs or pins 6, 6, which are also brought by the motion of the shaft 5, between the forked end of the lever 7; at this time a projection upon the cam wheel 8, fixed upon the shaft 5, causes the lever 7, to move outward, and slide the bar with the pair of fingers 1, on to the nail just before it is cut off from the rod; and by the motion of the shaft carry it over into the second pair of moulding dies 9; when another projection upon the cam 8, will move the lever 7, away, and the bar 3, and with it the spring clips 1, leaving the nail in the second moulding dies, which have previously taken fasthold of it.

The second pair of moulding dies may give their pressure to the nail by means of any of the different motions of the moulding dies *a*, *b*, as before described, or in any other convenient means which it is not necessary here to describe.

It will be evidently seen by all competent mechanics, that the moving parts of these machines may be altered considerably in their arrangements; for instance, the lever *c*, and *d*, in fig. 13, may be connected together by toothed wheels, fixed upon the axle *e*, *f*, as described in fig. 21, so that these movements may be simultaneous, and only one rod *g*, and cam wheel *h*, be necessary. Also, that the heading dies may be mounted upon sliding bars, actuated by cam wheels, or in levers moved by cranks

upon the main shaft, and that the moulding dies be made to open and shut otherwise, than by toggle jointed levers and bars, and yet the motion and effect of the dies remain the same—for instance, they may be connected together by a strap, loop, or bar, which may be placed upon either of the axles *e, f*, and upon the other an eccentric or cam, working in the connecting strap or bar, which will bring the dies together at the time the heading or moulding of the shank is performed, which will assist that operation, and also be made to open them when necessary.

My improvements in machinery for making or forming that kind or description of nail for which a Patent was granted by his present Majesty to Richard Prosser, of Birmingham, on the 13th day of July, 1831, a description of which will be found in the Specification of that Patent, consist in the peculiar formation or construction of the dies, punches, or tools for effecting the different required operations, and as they may be worked to good effect in several different ways, I have shown in Plate XVI, figs. 1 to 16, several different machines or methods of using them. Fig. 1, represents an elevation of one of the machines for forming the blanks or parts which constitute the head of the nail.

The tool or punch which cuts out the piece to form the head of the nail from the rolled sheet metal of any description proper for the purpose, is shown at *A*, and the bed or counter die against which the tool or punch cuts is shown at *B*, both being shown in section at fig. 2. The tube or punch is made to descend until it enters the bed or counter die, which is stationary. The punch is hollow, and equal in internal diameter to the head of the nail intended to be made. The part *C*, which is fixed into the bed *B*, is of a diameter somewhat smaller than the inside diameter of the tube or punch *A*, and of the same form which is intended

to be given to the head of the nail ; the end of the punch *A*, is made conical on the inside, so as to bring it to a cutting edge all round its circumference, the sheet of metal being placed between the punch *A*, and counter die *B*. Motion being given to the machine by any convenient means (such as the crank shaft *E*, connecting rod *F*, and lever *H*,) a circular disc or blank will be cut out of the sheet of metal, equal in diameter to the outside of the punch. The blank so cut would pass down into the bed but for the interposition of the piece of metal *C*, which obstructs the passage of the blank. The punch *A*, continuing to move downward after having cut out the blank, presses it on to the head of the piece *C*, and obliges it to take the same form while its edges are forced down by the inside of the tube or punch *A*, into the space between the piece *C*, and the inside of the die *B*, into the form shown in section at *a*, fig. 3, and in plan fig. 4. The blank *G*, in consequence, being equal in diameter to the inside of the tube or punch *A*, on its receding from the bed, carries the blank just formed with it. A few of the blanks *a*, *a*, so formed are exhibited, in the tube *A*, fig. 2, and are pushed upwards in succession by each succeeding blank, until they arrive at the top *D*, when they are allowed to fall into a receiver.

The piece *C*, in the dies *B*, may be made to move upwards and meet the punch *A*, after it has cut out the disc of metal by a lever, worked from the crank shaft forcing up the sliding piece *K*, in which the piece *C*, is mounted, shown in the section at fig. 5, thereby producing the same effect upon the disk, and forming the same shape blank. The blank *C*, may be removed out of the punch *A*, without its having to travel up it by the rod *L*, being pressed down by a lever connected to the crank shaft, or any other convenient means which will push the blank out of the punch, and allow of its being removed out of the way.

Another mode of forming these blanks is exhibited in which fig. 6, is an elevation of a machine, having the piece *c*, which forms the hollow or cup of the blanks placed within the punch *A*, as shown in the detached sections, figs. 7 and 8; and another lever *I*, to work it.

On the punch *A*, descending and cutting out the disk of metal as before described, the lever *I*, by means of the crank shaft causes the piece *c*, to descend and force the disk of metal into the dies *B*, and on its meeting with the smaller diameter of the hollow of the die, the disk is forced down by the piece *c*, (as shown in the section fig. 8), and out through the die *B*, thereby producing the same formed blank as before described.

Fig. 9, represents a machine for combining the different parts of these kinds of nails so as to constitute a complete nail. The pieces *b, b*, which form the back or underside of the head of the nails, may be formed by any convenient machine, and placed on to the beds *A, A*, fixed on to the revolving bed plate *E*, shown detached in fig. 14. A shank formed by the machinery above described, or by other means, is put through the hole in the centre of the back piece *b*, and the blank or part which forms the head *a*, (and which has been prepared as just described) is then placed over the shank *c*, and back piece, as shown in section in figs. 10 and 11, and being carried under the punch or tool *B*, remains stationary while the punch descends to unite the parts to form the nail, which is done by the peculiar formation of the tools or punch *B*, and dies *A*, as shown in section fig. 10, the nail when finished being shown in section at fig. 12, and in elevation at fig. 13.

As the punch *B*, descends, it first comes in contact with the head of the nail *a*, placed upon the piece *d*, (see fig. 10,) which piece is supported by a spring *e*, in the socket piece

f, resting upon shoulders in the bed *A*; and as the punch descends, it carries with it the parts of the nail, and the piece *d*, and enters the recess *g*, in the bed *A*, the peculiar form of which recess causes the edges of the head piece *a*, to turn in under the back piece, and thereby firmly unite the whole of the parts of the nail together.

The punch *B*, now ascends: the nail, and bed containing the nail, with the bed plate, move a part of a revolution, according to the number of dies placed upon the bed plate *E*, and another die is brought under the punch *B*, the parts forming the nail being placed in the revolving beds during the time they remain stationary, so as to be operated upon in succession. It will be perceived these beds must have an interrupted revolving motion, which I communicate by the star wheels *C*, and driving wheel *D*, already described, the bed plate *E*, being placed upon the upper end of the shaft *G*, of the star wheel *C*, see fig. 17. The driving wheel *D*, receiving its motion through the toothed wheel *H*, on its axis *I*, this wheel receives motion from a toothed wheel *J*, upon the back of the mitre wheel *K*, which takes into another mitre wheel *L*; upon the back of the wheel *L*, is another toothed wheel *M*, receiving motion from the driving wheel *N*, fixed upon the crank shaft. The punch or tool *B*, is actuated in the same way as that just described.

Fig. 15 and 16, are sections of the dies *A* and *B*, where the socket-piece *f*, is made capable of being moved upwards, so that its upper part may assist in turning in the edges of the head piece *a*, under the back piece *b*, shown in fig. 16, which may be effected by a lever placed in any convenient part of the machine pressing upon the adjusting screw *h*.

I must here observe that the parts of the above described machines for making these peculiar kind of nails, admit of a variety of different arrangements, and al-

though here described as separate machines may be placed upon one framing, receiving motion from one crank shaft, or the parts may be changed in position. The dies A, A, for instance, may be placed upon the periphery of a strong wheel, or revolving plate, which may receive an interrupted rotatory motion through the star wheel, driving wheel, and bevel wheels, as before described; or instead of a rotatory bed plate or wheel, a bed plate or bar may be used and moved backwards and forwards, bringing the die A, under the punch B, in succession, by a lever actuated by any convenient means, as by a step formed cam wheel upon the main shaft.

In conclusion I must remark that the same effect, as is produced by the second pair of moulding dies for finishing and pointing the nails formed by the machines above described, and shown in Plate XIV., may be obtained from one pair of moulding dies by the nail having a motion given to it by which it will be turned over, and its different sides presented to the pair of dies for pressure. This may be done by causing a pair of plyers or spring clips to take fast hold of the nail shank, and by giving them a reciprocating rotatory, or interrupted rotatory motion, they may be made to turn the nail one quarter of a revolution, by which the other sides of the nail shank, to those first operated upon, will be presented to the dies.

In machines where this is effected, it is obvious the heading die must be made to move sufficiently out of the way to allow of the necessary parts being introduced, and in some cases it would be desirable to remove the heading operation away from the moulding dies *a*, *b*, and perform it in some other part of the machine, where another pair of dies may be made to hold the nail shank, while the heading is performed. Fig. 18, represents a horizontal section of part of a machine where these two operations

are effected; *a, b*, are the moulding dies mounted in the wheels *c, d*, turning upon the axles *e, f*, as before described.

The nail shank in this machine is separated from the rod, before it is headed; but previously to this being effected, a pair of spring clips or carrying fingers *g, g*, are made to take hold of the shank. These spring clips are mounted in the tube *h*, which slides in the carrier piece *i, i*, connected by arms *j, j*, to the shaft or axle *k, k*, which has an interrupted rotatory motion as that described under fig. 26, Plate XV., by which means the spring clips will alternately be brought into the position at *A*, and take fast hold of the end of the nail rod. The dies *a, b*, having also taken hold of it to effect the moulding, and as they proceed to form the shank, it is with the spring clips *g, g*, pushed back into the position shown in the fig. at *A*. And on the cutter *l*, separating the nail shaft from the rod, and the dies *a, b*, opening the spring *m*, placed within the hollow *n*, of the carrier piece *i, i*, (by acting between the shoulder *o*, on the tube *h*, and the back of the hollow *n*,) will push the spring clips and nail shank into their former positions, and on being turned over one fourth of a revolution, will be ready to receive a second pressure from the next pair of dies *a, 2, b, 2*.

This turning over of the nail shank is effected by the following means:—Upon the end of the tube *h*, are fixed the arms *p, p*, (see the detached sections of the tube, figs. 19 and 20.) These arms are alternately acted upon by a pin *q*, fixed in a small lever *r*, attached by a joint to the bar *s*, sliding between the grooves *t, t*. On the motion of this sliding bar upwards, the pin *q*, comes in contact with one of the arms *p*, as represented in fig. 19, and forces it upwards into the position shown in fig. 20, thereby moving the tube *h*, one quarter of a revolution, and consequently

with it the spring clips *g, g*, and nail shank, which will thereby be made to present its other two sides to the dies *a 2, b 2*, to be operated upon.

As the sliding bar *s*, descends to effect the turning of the next nail shank, the pin *q*, passes over the arm *p*, below it, without disturbing it. The small spring *u*, which presses against the tail piece of the lever *r*, allowing it to move outwards to pass the arm *p*. After receiving a second pressure, the shank will be ready to be carried to the heading dies *v*, which is effected by the movement of the shaft *k*, and will then be in the position at *B*, that is, within the dies, they being open to receive the shank; and on their closing upon it by means of the lever *w*, (which carries one of the dies), the heading bar or lever *x*, is forced forward by any of the means before described, pushing the heading pin or die *y*, (mounted within the tube *k*,) up against the dies *v*, compressing the end of the shank and forming the head.

The inclined-plane parts of the spring clips causes them to open and make way for the heading pin as it is pushed forwards. On the nail being completed, the heading bar or lever *x*, is drawn back, and the lever *w*, moved outwards, opening the dies *v*, when the nail is allowed to fall away below, the dies *v*, then being ready to receive another nail shaft, to be brought into them by the next pair of spring clips *g, g*.—[*Introlled in the Rolls Chapel Office, August, 1833.*]

Specification drawn by Messrs. Newton and Berry.

To JOSEPH GIBBS, of Kent Terrace, Kent Road, in the county of Surrey, engineer, and AUGUSTUS APPLE-GARTH, of Crayford, in the county of Kent, calico printer, for certain improvements in steam carriages.
—[Sealed 29th September, 1832.]

A report of this Patent was given in our last, at page 277, but owing to the absence of the Editor (at that time engaged on business in a distant part of the kingdom), one feature of the proposed improvement, and the claims of the Patentees were, through inadvertency omitted; we now beg to correct that error, by adding the following to the former report.

Another variation in the construction of a boiler, suited to the generating of steam for locomotion and other purposes, (denominated a *cone-cylinder*), consists in a peculiar mode of forming the internal part of the boiler, so as to expose a much more extended surface to the action of the fire. Plate XIV. fig. 5, is a section taken longitudinally through the boiler, showing the *cone-cylinder* within; *a, a*, is the casing, or outer part of the vessel which is proposed to be held together internally by tie bolts, or cross bracings; *b* are the bars of the furnace; *c*, the steam chamber intended to be furnished with an apparatus similar to that already described, for separating the steam from the water, and it may have a waste-chamber, as shown at figs. 1 and 2; *d*, is the descending flue, which, instead of being formed of copper tubes as the boiler before described, is constituted by an inner casing bent into the forms of hollow cones, the apexes of which may meet or pass each other in the centre of the cylinder, in order that the fire and heated air, as it passes down the interior of the cylinder, towards the chimney *e*, may act upon every part of the surfaces of the cones.

The object of the cones, it will be perceived, is merely to obtain an extended surface of the water vessel, upon which the fire and heated vapour is to act; and, therefore, they may be arranged in various ways, as circumstances shall require, either with a descending current for the fire and heated vapour, or an ascending or horizontal current, or with either or both combined.

The cones may be made to project from the water vessel, as shown in the figure, or they may be arranged directly over the fire, or above the current of heated air, as well as placed around the current, it being impossible to describe all the variations of arrangement of which the plan is susceptible.

The proportions of the surfaces of the cones to their bases may be varied, and it may be better that those cones which are nearest to the fire should be more obtuse than those which are more distant, in order that the steam may escape more readily.

It is not necessary that these projections should be precisely of the forms of cones; for instance, they may be wedge-shaped prisms, or hopper shaped, or parallelograms having rounded edges, or of any convenient form which can be connected by its base to the boiler or vessel containing the water.

These boilers may be made of cast or of wrought iron, welded or riveted, or of any other suitable materials, and the outer casing of any convenient figure. It should, however, be observed, that the whole of the cylinder *d*, is to be furnished with circles of cones in the manner shown in fig. 5, and also in the horizontal section, fig. 6, having pipes to convey the water from the upper part of the boiler to the lower part, in case any of the other passages should be obstructed by the rising of the steam. There

must also be a pipe by which the boiler may be fed by a force pump in the usual way.

“Lastly, the improvements for which we claim the protection of His Majesty’s Royal Letters Patent, consist first, in the new arrangement and combination of the various parts of a steam carriage, as shown in the different figures; secondly, in the new arrangement and construction of a boiler, consisting of double casings and hollow cones filled with water as above described; thirdly, in the combination of shafts, wheels, couplers, and springs, as shown in figs. 1 and 2, for the purpose of obtaining two or more rates of motion in the road wheels of steam carriages, while the pistons of the engines continue to move at a uniform rate. And, fourthly, in the propelling or pushing any vehicle on the common roads by means of a steam carriage, consisting of a boiler, engines, and moving apparatus, as above described, which steam carriage may be entirely separated and removed from the said vehicle in contra-distinction to drawing or pulling any such vehicle; but we do not confine ourselves to the particular modes of application herein shown.”—[*Inrolled in the Inrolment Office, March, 1833.*]

To JOHN WALMSLY, of Manchester, in the county of Lancaster, silk-winder, for his having invented a machine for cutting off fur or hair from beaver and other skins.—[Sealed 15, March, 1832.]

THIS invention is a machine for cutting the fur from beavers and other skins for the use of hatters, and consists principally in the adaptation of a pair of revolving fluted rollers, which draw forward the skins in a distended form,

and conduct them over an edge rail, where the furry side is presented to the action of a cutter which slides to and fro in a horizontal frame.

The general construction of the machine will be understood from the front and side elevations shown in Plate XIV. at figs. 7 and 8, but it appears to us that a section taken through the middle would have been more eligible, as we are not enabled by the views appended to the specification to discover the situation of the cutter, or of edge or ledger blade, as it would be technically called, against which the cutter acts.

The main rotatory shaft *a*, *a*, is to be put in motion, either by the winch or handle, or by a band passed round the rigger *b*. At one extremity of this shaft is attached the fly wheel *c*, for the purpose of regulating or equalizing the motion; and upon the same shaft also is fixed the cam or excentric wheel or snail *d*.

The feeding rollers between which the skins are conducted, are shown at *e*, *e*; the upper one bearing upon the lower and pressed down by weighted levers. The rotatory motions of these rollers are connected together by spur wheels *f*, at their ends.

The carriage of the cutter is partially seen at *g*, sliding in grooves in the standard. It is made to reciprocate to and fro by means of the rod *h*, which is connected at one end to an excentric pivot, fixed in an arm of the fly wheel, and at the reverse end is attached by a joint to the sliding cutter frame.

The operations of the machine are these: the skin passed between the rollers, is distended and brought over an edge rail, the furry surface being presented toward the knife; rotatory motion is then given to the shaft *a*, which, by carrying round the snail or excentric wheel *d*, causes the larger diameter of the snail to depress a lever connected to

the click *i*. By these means the click is made to push round the ratchet wheel *k*, the distance of one tooth ; and this ratchet wheel being fixed on the end of the lower drawing roller *l*, gives to both drawing rollers a small degree of rotatory motion, which advances the skin a trifling distance. At every rotation of the shaft *a*, the same depression of the lever and click *i*, takes place, they being raised again by a spring as soon as the force of the snail is removed, consequently a succession of these depressions at intervals, gives to the ratchet wheel a rotatory movement, and causes the drawing roller to conduct the skin gradually through the machine over the edge rail against the reciprocating cutter, for the purpose of having the fur shorn off from its entire surface.

By the same rotatory action of the shaft *a*, the fly wheel *e*, affixed to its end, is driven round ; and the rod *h*, connected by a joint to the fly-wheel, is made to perform a reciprocating movement ; and the reverse end of this rod being also by a joint connected to the frame of the cutter *g*, the frame is by that means made to reciprocate, and to conduct the knife to and fro across the machine, against the edge of the distended skin, from which the fur is shorn off as it passes.

There is a provision to keep the edge of the knife sharp by means of some steel rods, which bear against the edge of the knife, and by the friction as the knife passes to and fro, the continued sharpening is produced ; but the exact situation of these sharpeners does not clearly appear from the Specification.

The concluding paragraph runs thus—"having described the construction and method of operating with my invention of a machine for cutting the fur off beavers, and other skins, I do not claim as of my invention, any of the separate or well known parts of which my machine is con-

structed; but I do claim as my invention, the general arrangement of the whole, together with the application of sharpeners as described, to a machine for cutting furs from skins, all which I believe to be new, and never before practised in this kingdom.—[*Inrolled in the Inrolment Office, September, 1832.*]

Original Communications.

MAJOR SHAW ON A CORPORATE COMPANY TO PROTECT INVENTIONS.

To the Editor of the London Journal and Repertory of Arts

SIR,

OBSERVING in the public prints that the Patent Laws are under revision, allow me to offer a few observations on the subject, leading to a point which has not been discussed.

I beg to acquaint you that about two years ago, I convened, with some other gentlemen, a public meeting by advertisement, to be held at the Crown and Anchor Tavern, Strand, London, for the purpose of framing a petition to the legislature to abolish the present Patent Laws, and to reduce the price of Patents, so that every poor mechanic would be enabled to take out a Patent for their Inventions. The meeting was eventually removed to the Theatre of the London Mechanics' Institution, in Southampton Buildings,

Chancery Lane, as a more convenient and appropriate place, and the meeting was very fully attended.

Lord Clanricarde was invited to take the chair; and, upon his Lordship declining, I was nominated to that office. The result of this meeting was the appointment of a Committee to draw up a Petition for the signature of such as would sign it, to be presented to Parliament; but in consequence of many of the members appointed to this Committee not being able to leave their respective occupations to attend, the business came to nothing. I therefore gave up the chair to Dr. Birkbeck, and I believe nothing was done. I however gave the Committee a plan, which was to petition Government to abrogate the present Patent Laws, and to constitute in their place a Chartered Company, to be called "The Mechanical Inventions Company," similar to the Chartered Stationery Company, and that no Patent to be deemed good or legal unless taken out from this Company, according to the rules and regulations of the Company, which required the Patentee to bring a model or drawing of the article he wished to take out a Patent for, to pay (say) ten or twenty pounds as the tax to Government, and one pound ten shillings more towards the expenses of the Company, for building or renting premises for the models and drawings of each Patentee sent to the Company, and for other incidental expenses.

This Chartered Company to be under the management of a Governor, Vice-President, a Managing Committee of twelve persons, with a Treasurer, a Secretary, and a sufficient number of Clerks. Enclosed I send a more ample detail of the rules. If the expense of a Patent exceeds ten or twenty pounds, it will afford no relief to the poor mechanics, and the Patent Laws had better remain as they are. Government will receive a much greater revenue from Patents by adopting my suggestions, for then one

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hundred Patents will be taken out for one by the present laws,

I have myself seven different models and drawings ready for Patents,—first, for propelling ships at sea ; second, for an easy and readier manner of heaving up anchors on board ships ; a third, an improvement in the sails of ships ; a fourth, for a machine in agriculture ; a fifth, an improvement in the draught of carriages ; a sixth, a bridge for crossing broad and rapid rivers ; and the seventh, a defence on board merchant ships against being boarded by pirates and others, when in harbour or at sea. Now, taking each Patent at the present price of Patents for the three kingdoms. viz. £400, it will cost me £2800 for my seven Patents, which is too great a sum for any person to risk, let them be ever so independant. It is true if one of them served I should be reimbursed, but if not, what a sum to lose.

Such a Company would not infringe upon any other Company, and therefore could not create jealousy, but confer a lasting benefit to every poor mechanic. I perused both Mr. Godson's and your Birmingham and Leeds (Improvement) Bills on the Patent Laws, but both appear to me to favour too much the lawyers. Why not do without lawyers ?

In entering a book in the Stationery Company, the author or proprietor has nothing more to do than to leave eleven copies of his book at their office, pay two shillings and sixpence to the Secretary, and get his receipt for the same ; his work or book then becomes his sole property, and no one dares to sell them without his permission ; all this is effected without the expence of employing lawyers. Why not give the poor industrious mechanics the same advantage ?

Government would lose nothing by the adoption of such

a plan ; on the contrary, a great saving would accrue to the public by abolishing the Patent Offices, and all the expences attached to those establishments, besides the expence of collecting the tax on Patents, as this Company would take that responsibility upon themselves, and be accountable to Government for the same ; and to the poor mechanic it would be more beneficent than any manner that could be suggested for the grievance complained of by every person respecting the present Patent Laws.

It is the fault of the mechanics themselves that the present arbitrary laws on Patents remain in force—they are, in fact, a complete prohibition to every poor mechanic taking out a Patent, for scarcely one out of one hundred individuals can pay the present enormous sum for a Patent, by which many a useful invention is lost to the public.

In suggesting this Chartered Mechanics' Company, I have the Chartered Stationers' Company for my model ; I am the author of two books on different subjects, which I have entered at Stationers' Hall, for which I paid only three shillings each book, without the aid of any lawyer, and they were as secure to me as any Letters Patent are to a Patentee.

I beg to submit this letter to the consideration of the gentlemen and members of the Committees interested in the Patent Laws, in the hope that some good from it may arise.

I am, Sir,

Yours, &c.

H. SHAW.

Grove Place, Brompton.

SUGGESTED RULES

For a Chartered Mechanical Invention Company.

THE Company to consist of a Governor, a Vice-President, a Managing Committee of twelve persons (Patentees if possible), a Treasurer, a Secretary, Clerks, &c.

The President to be chosen every three years out of the Committee of twelve; no President to be re-chosen until the whole of the Committee have been President; the Vice-President to be chosen for life, and to receive a stipulated salary; the Treasurer, Secretary, and Clerks also to receive salaries.

The President or Governor, and eight of the Committee, with Vice-President, to constitute a General Board.

The Vice-President, and ten of the Committee, to constitute a General Board.

The whole must attend to constitute a full Board.

Rules for taking out a Patent.

ARTICLE 1st.—Every person taking out a Patent, must bring with them either a Model or Drawing of their Invention, to the Office of the Company, together with a full written description of their Invention, with their name signed by themselves and two witnesses, and at the same time to pay £10 (or £20) as a Tax to Government on Mechanical Inventions; and £ 1. 10s. more towards the expenses of the Company for the renting or building premises, regis-

tering the Patent, and for the salaries of the Vice-President, Treasurer, Secretary, and Clerks.

II.—On paying the requisite fees and lodging the Model or Drawing, and written Descriptions of their Invention, the Patentee will receive a printed document, signed by the President and Secretary of the Company on parchment, being the Patent of his Invention, and as a security for the same.

III.—The Patentee, after having taken out his Patent, must insert three times in the Government Gazette, his having taken his Patent, and describe his Invention, and also for the period he has taken it out.

IV.—Patents to last 25 years for the United Kingdom. But if required beyond that period, to pay as a Government Tax according to the following scale, viz.

For 25 years	£10
For 50 years	20
For 75 years	30
For any number above } 75 years	50

No Patents will be renewed after the expiration of their respective periods.

V.—No Patent to be deemed good or legal, unless taken out from this Chartered Company.

VI.—All Infringements, or what are called Improvements, on other persons' Patents, if deemed an Infringement by the Patentee, to be decided by a full Board, consisting of all the Members of the Chartered

Company, from which no appeal is to be afterwards made in any Court of Law.

This will operate every way with regard to the saving of Law expenses, equally to all the parties concerned.

VII.—All new substances made, all new invented machines, all principles newly discovered, all new applications which when reduced into practice to produce some article fit for sale; all chemical discoveries, methods or process which result in, or produce an article of commerce, shall be the subjects for which Patents shall be granted.

VIII.—The printed document given from this Company as a security to the Patentee, as a security for his Invention, shall be printed on parchment, with the Government Stamp for the amount of the sum paid, the name of the article or Invention, and the period the Patent is granted.

N.B.—Other rules could be added if necessary.

To the Editor of the London Journal and Repertory of Arts.

SIR,

HAVE the goodness not to lose sight of the clauses proposed below, which are, in the opinion of myself and many others, considered to be of very great importance, both to the public and all Patentees, so much so, that few clauses will be found more essential.

*Clauses recommended to be inserted in the amended Bill for
Patents.*

1st. And whereas much mischief arises, both to the proprietors of Patents and to the public at large, by reason of persons pretending, by advertisement and otherwise, that certain article or articles vended by them are Patent Inventions; be it enacted, that any person or persons so offending, shall forfeit the sum of ten pounds for each offence.

2nd. And be it further enacted, that one moiety of the forfeiture hereby imposed shall, if sued for within three calendar months from the time of such forfeiture being incurred, be to his Majesty, his heirs and successors; and the other moiety, with full costs of suit, to the person or persons who shall inform or sue for the same within the time aforesaid, and which shall and may be sued for in His Majesty's Court of Exchequer at Westminster.



NEW PATENT LAWS.

THE Bill before Parliament for amending the Laws relating to Patent Inventions, is still under the surveillance of the Select Committee of the House of Commons, but it is expected that it will be reported to the House in a day or two (probably before this meets the public eye). The several clauses have, as we understand, been materially altered, and we should be glad if we could add improved, but, from the draft copy that has been handed to us as the most improved edition of the amendments upon the

proposed Bill, which we believe to be correct, though of course cannot vouch for them until the Bill itself is printed, we have little to offer in the way of congratulation to the numerous readers of our Journal, who are deeply interested in the property of Patent Inventions.

It is intended by the Committee to divide the several clauses into two Bills; the one of which is to be read immediately and passed into a law, the other to remain for discussion in the next session. This is to be proposed as a matter of expediency; in order that those clauses which are open to discussion may not be brought before the House at this late period of the session, occupied as Parliament at present is with business of a more important nature, in the estimation of the political world.

Such a measure of expediency we have no objection to, as the immediate enactment of a part of the Bill will, at all events, recognize the right of inventors to legal protection, and we may then at a future day expect from Parliament a further consideration of the subject, with the view of granting to inventors a more complete security, and relief from that pecuniary pressure to which needy genius is at present subjected, by the useless retinue of state parade attendant upon the grant of Letters Patent for Inventions.

The following are the clauses of the Bill in the most amended state that we have been able to procure them :

I. WHEREAS it is expedient that the Laws respecting Letters Patent for Inventions should be explained and amended, and should be made effectual for the security of the property of the inventors in their inventions; be it therefore enacted, by the King's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same; that if any person in England, Scotland, the town of Berwick-upon-Tweed,

Ireland, or the colonies, shall communicate or sell any invention, of which he is bona fide the inventor, to any person whomsoever, such last mentioned person shall, with the consent of such inventor, be at liberty to obtain Letters Patent in his own name, for the same invention; provided the said Letters Patent shall contain a recital, stating by whom the said invention hath been communicated or sold to the person to whom the said Letters Patent are granted, and that the said Letters Patent shall be void if it shall thereafter appear that any fraud has been used, or that the recital is untrue.

II. And whereas doubts have arisen respecting the subjects for which Patents ought to be granted; be it further enacted, first, that every new engine, manufactured article, or article of sale, and material thing produced artificially. Secondly, every new process used in making or obtaining any new or previously known engine, manufactured article, and article of sale, and material thing produced artificially, even if such process being only new as applies to the particular engine, manufactured article, or article of sale or material thing produced artificially, in question, or any part thereof. Thirdly, every new application of any known engine, manufactured article, or article of sale, material thing produced artificially, or process, such engine, manufactured article, article of sale, or material thing produced artificially, or process requiring some new modification, combination, or arrangement, for the purpose of such application. And, fourthly, every improvement on any known engine, manufactured article, or article of sale, or material thing produced artificially, or on any known process, shall be the subjects for which Letters Patent shall be granted: provided always, that nothing in this Act contained shall extend to allow any person to use the whole or any part of any invention, for which Letters Patent have been granted, for the purpose of any improvement of which such person may be the inventor, without the consent in writing of the Patentee.

III. And whereas it hath frequently happened, to the great prejudice of inventors, that on the trials of issues relating to Letters Patent, evidence has, for the purpose of shewing a

want of perfect novelty in the invention, been given of a use prior to the granting of Letters Patent, of the subject of the Patent, in an imperfect state or manner, or privately, or at a period long anterior to the date of the Letters Patent; be it further enacted, that the Letters Patent shall not become void, although the subject of the Patent shall have been used either privately, or in an imperfect manner; nor if the same subject shall not have been practically used in a public manner within ten years next preceding the date of the said Letters Patent: Provided nevertheless that the persons who shall have so privately used or practised such subject of a Patent, whether perfectly or imperfectly, shall be allowed to continue to use or practise it in the same degree of perfection, and to the same extent, but no further.

IV. And whereas it sometimes happens that omissions or errors are accidentally or unintentionally made in the Patent, and in the specification, whereby Patents are rendered void: be it enacted, that every such Patent, or the specification, inrolled in compliance with the conditions thereof, as is or shall be bad in law as to part thereof, whether from want of novelty, insufficiency of description, or from any other cause, shall not on that account be deemed bad in law as to the remainder thereof.

V. Provided always, and be it further enacted, that if upon the trial of any issue in, or directed by, either of the superior Courts of Record at Westminster, in which the validity or sufficiency of a Patent or Specification shall come in question, it shall appear that the Patent or Specification has been made or left, or continued erroneous, defective, or insufficient in description, for the purpose of defrauding the public of the full benefit of the invention, then and in such case the said Patent shall be and be deemed to be null and void, to all intents and purposes whatsoever: provided always nevertheless, that if the Jurors, by whom such issue as aforesaid shall be tried, shall find the title to such Patent, or such original or amended Specification, was defective or insufficient in description, only from too extensive a claim of invention, or from inadvertence only, and without fraud, that then and in

such case it shall be lawful for the Lord High Chancellor or Keeper of the Great Seal, upon petition made to him, stating the several facts of the case, to direct such alteration in the title of the Patent, and in the said Specification, or either of them, as shall truly describe the invention.

VI. And be it further enacted, that all such further and amended Specifications as are by this Act directed, shall be written each on parchment, having a stamp impressed thereon, of equal value with the stamp which would at the time be requisite on an original Specification, and shall be inrolled in like manner as original Specifications are now inrolled.

VII. And be it further enacted, that the Court or Judge before whom any proceedings at law or in equity shall be taken upon any Letters Patent, shall have power, and are and is hereby authorized to amend the title or specification in all matters of form.

VIII. And whereas it has been the practice to make the title to a Patent so vague and general, that the public have been unable to know for what particular object the Patent was sought, whereby caveats have been unnecessarily multiplied, and other inconveniences have been occasioned; be it enacted, that the inventor shall in all cases give such a title to his Patent as shall contain such an outline or sketch of his invention as will convey a clear and distinct idea of its nature and object.

IX. And be it further enacted, that Letters Patent shall, for the preservation of the property in the invention to the inventor, begin and take effect, and the Letters Patent shall bear date, on the day of presenting the Petition for the Patent, at the Office of the Secretary of State for the Home Department.

X. And whereas the use of the property in Letters Patent is limited without any corresponding advantage to the public; be it enacted, that every person to whom Letters Patent for an invention shall have been granted, shall be at liberty to assign or transfer his interest in the same Letters Patent, and to grant Licences to make or use the invention for which the same shall have been granted, in any manner or to any number of persons he may think fit.

XI. And whereas great delay, inconvenience, and expense have arisen, in consequence of a Patentee being obliged to sue in a Court of Equity, pending a suit in a court of common law: be it enacted that the plaintiff in an action in a common law court, may, by motion in that court, or by application to a judge thereof, obtain an order to stay the defendant from making or using the invention, unless an account be kept of the sale and use thereof, to be verified on oath, and rendered periodically, and at such times as such court or Judge shall direct.

XII. And be it further enacted, that the defendant in any action on a Patent, may plead the general issue: provided nevertheless that in every such action, the defendant shall at the time of pleading deliver a notice of all the objections and defences upon which he intends to rely at the trial of the issue, save and except in cases of *scire facias*.

XIII. And be it further enacted, that the venue in any action on a Patent may, on motion to the Court or Judge in which such action is brought, be changed from the county of Middlesex to any other county, if the said Court or Judge shall think fit.

XIV. And be it further enacted, that either party may obtain an order of the court in which such action is brought, that the jurors who are to try the issue may examine the specification and accompanying drawings at least two days before the day of trial.

XV. And be it further enacted, that this Act shall come into force and take effect from the passing thereof, and that all the provisions therein contained shall apply to all Letters Patent then unexpired, as well as to all Letters Patent thereafter to be granted.

XVI. Provided always, and be it further enacted, that this Act shall not extend, or be construed to extend, to any Letters Patent to uphold which, or for the infringement of which any suit or suits at law or in equity has or have been tried and determined in favor of the defendant or defendants in such suit or suits, or in which the plaintiff or plaintiffs at law have been nonsuited, or suffered judgment as in case of a nonsuit, or in which an injunction hath been refused, or having been granted

hath been dissolved in any Court of Equity before the passing of this Act, nor to any Letters Patent in respect of which any suit or suits at law or in equity is or are now depending : And whereas by an Act made and passed in the twenty-sixth year of the reign of his late Majesty King George the Third, intituled, " An Act for the encouragement of the arts of designing and printing linens, calicoes, and muslins, by vesting the properties thereof in the designers, printers, and proprietors thereof for a limited time," continued by an Act made and passed in the twenty-ninth year of the reign of his said late Majesty, and made perpetual by an Act made and passed in the thirty-fourth year of the reign of his said late Majesty, the property in the patterns or designs for such purposes is secured to the inventors thereof for a limited time : And whereas it is expedient that original patterns for other purposes shall be secured to the inventors for a limited time, and that the time limited by the said Acts be in all cases extended ; be it enacted, that the inventor of every new pattern for any manufactured article, his executors, administrators, and assigns, shall have the exclusive right to use the same pattern for and during the period of twelve calendar months next after the same shall have been made public.

XVII. And be it further enacted, that all and singular the clauses, provisoes, and regulations in the said before-mentioned or recited Acts contained, shall extend and apply to all new patterns for all manufactured articles to which they shall be found to be applicable.

(All the following Clauses, excepting the last, are proposed to be embodied in a separate Bill.)

XVIII. And be it further enacted, that notwithstanding any law or custom to the contrary, his Majesty shall be and is hereby empowered to grant Letters Patent for inventions for the term of seven years, or of fourteen years, at an expense proportionate to the term, as is hereafter expressed and enacted, for the sole working or making of any manner of invention in England, Ireland, Scotland, and the town of Berwick-upon-Tweed, or

the Colonies, to the inventor of such manufacture, or his assignee, which others at the time of making such Letters Patent shall not publicly use in England, Ireland, Scotland, the town of Berwick-upon-Tweed, or the Colonies, so as it be not mischievous to the state: provided the said inventor shall particularly describe and ascertain the nature of the said invention, and in what manner the same is to be performed, by an instrument in writing under his hand and seal, and cause the same to be inrolled in the High Court of Chancery within a limited time next after the date of the said Letters Patent.

XIX. And whereas it has hitherto been the practice to grant separate Patents for England, or for England and the Colonies, for Ireland, and for Scotland, and such practice hath been productive of injury and delay to inventors, and of great unnecessary trouble and expense; be it enacted, that all Letters Patent for inventions shall be taken out in England, and shall be sealed with the great seal, and shall extend to and have effect in England, Ireland, Scotland, the town of Berwick-upon-Tweed, and the Colonies, and that such Letters Patent shall be granted upon the condition, to be expressed in such Letters Patent, that the inventor shall, within six calendar months next after the sealing thereof, inrol a specification in England in the usual manner now practised in England, and shall also within the same period inrol or deposit in Ireland and in Scotland, in each country, in the usual places of inrolment or deposit of specifications, a copy of the Patent and Specification.

XX. And be it further enacted, that Letters Patent for inventions may be granted to persons who shall have received the communication of the invention from persons residing in places out of his majesty's dominions: provided always, that in any such case the Patent shall be granted for the term of seven years only.

XXI. And whereas there is often great difficulty in getting a full description of an invention by which it can be readily performed or made, either by a written account or drawings thereof; be it further enacted, that it shall be lawful for the Patentee, in

addition to, but not in any degree in substitution of, his written description, to deposit a model or pattern of his invention, with his specification, and that the said model or pattern may be produced or given in evidence in any Court of Law or Equity, with the specification.

XXII. And whereas great abuses have sprung up from the manner in which persons enter *caveats* in the Court of Chancery, and at the offices of the Attorney and Solicitor-General, and many inventors have been injured by the secrets of their inventions prematurely transpiring; be it enacted, that each person or party entering a *caveat* shall, at the time of opposing the grant of a Patent, lodge in the office of the Attorney-General, an outline or description of his own invention, which he imagines or thinks is about to be made the subject of Letters Patent to be granted to another person.

XXIII. And be it further enacted, that the Attorney or Solicitor-General shall and may, on the examination by him of the claims of contending parties under a *caveat*, award such costs as he in his discretion shall think fit to be paid by either of such parties to the other of them, and grant a certificate thereof under his hand, which certificate may be made a rule of either of his majesty's Courts of Record at Westminster, and the party to whom the costs are awarded shall have the usual process of attachment in case of non-payment thereof.

XXIV. And be it further enacted, that the fees payable for Letters Patent granted for the term of seven years, shall be two-thirds of the fees which shall be paid upon Letters Patent granted for fourteen years.

XXV. And whereas the sign manual of his Majesty, which, according to the present mode of obtaining Patents is requisite, may, without detriment to the public service, be dispensed with as to the warrant and bill of Letters Patent; be it further enacted, that the Lord High Chancellor or Keeper of the great seal may fix the great seal to Letters Patent for Inventions, upon the authority of the report and bill of his Majesty's Attorney or Solicitor General.

XXVI. And be it further enacted, that in every action or suit in which the validity or sufficiency of Letters Patent for an Invention, or of the Specification, shall come in question, the costs to be paid for either party to the other shall include the costs of necessary scientific witnesses, and also the costs of making necessary experiments.

XXVII. And be it further enacted, that this Act shall extend to Scotland and Ireland.



HEADS OF A BILL

FOR AMENDING

THE LAW RELATING TO PATENTS FOR
INVENTIONS.

Proposed by the Committee held at the Royal Hotel,

• MANCHESTER.

JOHN POTTER, CHAIRMAN.

WHEREAS it is expedient to amend the Laws relating to Patents for Inventions :—

Be it therefore enacted by the KING'S most Excellent MAJESTY, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, THAT so much of an Act passed in the Twenty-first year of the Reign of King James the First, entituled, "*An Act concerning Monopolies and Dispensations with Penal Laws, and the Forfeitures thereof,*" as relates to Letters Patent and grants of privilege for the sole working or making of any manner of new Manufactures within the

Realm, be, and the same is hereby repealed; except so far as relates to any Letters Patent or grants of privilege, heretofore granted under the authority of the same Act.

THAT Patents of Invention shall be granted for a limited time in the manner hereinafter mentioned, to those who in the Kingdom of England shall have made an Invention or essential Improvement in any branch of Arts or Manufactures; and also to those residing in England, who shall first introduce or practise an Invention or Improvement made in Foreign countries: and every such Patent shall confer on the inventor, his executors, administrators, and assigns, exclusive rights to the sole making, working, exercising, and vending of such Invention or Improvement, during the time therein limited: Provided, that Patents of Invention shall not confer any rights inconsistent with any other existing patent rights.

THAT every invention shall be considered new which has not been practically used within years next preceding the date of the Patent, or which has been used only privately, or partially, and without any beneficial result.

THAT the applicant for a Patent of Invention shall present a petition to His Majesty, stating the intended title of the invention, and that he is, to the best of his knowledge, the true inventor thereof; or, in cases of communication from abroad, that such invention has not been before published in England, and praying for the grant of a Patent for the Invention for the term of seven years, or fourteen years, at his option; the statements in which petition shall be verified by affidavit.

THAT such Petition and affidavit shall be accompanied by a specification, sealed up, describing or defining the object, principles, and general nature of the invention, and

the Patent applied for ought to be granted or not ; and within the term of *FOUR* Calendar Months from the date of his report, the petitioner may make and enrol any enlarged or completed Specification of his invention, as hereinafter mentioned.

THAT the person entering such caveat as aforesaid shall not offer any objection to the grant of the Patent applied for, other than that the applicant is not entitled to such grant, on the ground that the objector has already a vested Patent right, or has discovered and used a similar invention, for which he was about to solicit a Patent.

THAT the Attorney or Solicitor-General shall appoint two competent persons practically skilled in the Arts and Sciences, to be called Commissioners of Patent Inventions, whose duty it shall be to examine, and state in each case whether the applicant is entitled to the grant of a Patent ; and if not so entitled, the ground of objection to the application, of the nature of which the applicant shall be informed.

THAT if the Attorney or Solicitor-General shall report in favour of the application, the Secretary of State shall issue a certificate of the Grant of a Patent to the applicant, for the period to be mentioned in such certificate : Provided, that several and distinct Inventions shall not be included in one certificate of Grant.

THAT within such period of time as shall be appointed in the said certificate of Grant, the Patentee may, if he shall think it necessary, make and lodge in the office of the Secretary of State, an instrument under his hand, containing an enlarged and completed Specification of his said invention ; but such enlarged or completed specification shall not depart from the principle or objects embraced or stated in the first specification hereinbefore required.

THAT such specification may, for the better explanation and illustration of the invention intended to be described, refer to drawings, patterns, and models of the subject of such invention, which drawings, patterns, and models shall be considered parts of the said specification, and be delivered and kept therewith; and in every action or cause at law affecting any Patent, either party may obtain an order of Court that the Jurors may examine the drawings, patterns, and models (if any) lodged with the specification of such Patent before the trial.

THAT if any person shall, from any cause, be bad in law, for part only of the matters specified therein, the same shall not, therefore, be bad in law as to the remainder of such matters; but in case any court of competent jurisdiction shall determine that such Patent is bad in law in part, the Patentee shall, within one calendar month after such determination shall have been pronounced, make and deliver a supplementary specification of his invention, confining the same to such part of his said invention as shall not have been declared bad as aforesaid.

THAT any inventor, having obtained a Patent for seven or fourteen years, or his assigns, may, at any time before the expiration of such term, present a petition for an extension of such term for seven years further, which petition shall state the grounds of such application, and shall be verified by affidavit, and the same shall be referred to the Attorney or Solicitor-General, who shall, within thirty days from the time of the said petition being presented, consider the allegations contained in the said petition and affidavit, and shall report on the fitness of such extension, and if such report to the Secretary of State shall be in favour of the extension applied for, a supplementary certificate for the extended term of seven years

shall be made out and delivered to the applicant in like manner as the original certificate.

THAT the fees payable upon and for the grant of every Patent for England, if for the term of seven years, shall be £30, if for the term of fourteen years shall be £60, and the same sums on any extension of the original term. Every Patent granted as aforesaid may be extended to Ireland and Scotland, or either of those kingdoms, on payment of the additional sum of £20 for each kingdom, and the Secretary of State's certificate of grant shall express the same accordingly: provided, that the inventor shall, within fourteen days after the time limited for the making and delivery of his enlarged and completed specification in England, make and deliver at the

office in Ireland, or the

office in Scotland, a duplicate of such his enlarged and completed specification (if any), or otherwise, of his first and only specification, and of the drawings, patterns, and models accompanying the same.

THAT one-half of all such before-mentioned fees shall be paid by way of deposit at the time of presenting the petition for the Patent, in respect of which the same fees shall be payable, and the remaining half on the delivery of the certificate of grant to the patentee.

THAT if the Attorney or Solicitor-General for England shall report against the fitness of granting any Patent which shall have been applied for, then one-half of the said original deposit shall be returned to the applicant, together with his petition, affidavit, and specification.

THAT every person who shall enter a caveat against the grant of any Patent as hereinbefore mentioned, shall, at the time of entering the same, pay the sum of £10 to cover the office fees and expenses consequent on such caveat; and on the hearings consequent on such caveat,

the original applicant for the Patent shall not be required to pay any fee.

THAT this Act shall commence and take effect, as to the mode of obtaining Patents and specifying Inventions, on the day of and that all the other provisions herein contained shall apply to Patents then in force, as well as to Patents thereafter to be granted.

THAT this Act shall not extend to Ireland or Scotland, further than is hereby expressly provided.

*Society for the Encouragement of Arts, Manufactures, and
Commerce.*

The Rewards adjudged by the Society during the present Session, to the respective Candidates, in the following order. Presented by His Royal Highness the Duke of Sussex, President.

In the Classes of Mechanics, Chemistry, and Agriculture.

To Mrs. Gilbert, of Eastbourn, Sussex, for bringing sea-side shingle into cultivation, the silver Ceres medal.

— Mr. George Whitelaw, Eglinton-street, Glasgow, for his proposed method of raising water, and his method of supplying water to high pressure steam-boilers, the large silver medal.

— Mr. W. Franks, Cursitor-street, Chancery-lane, for his combination of wheel-work for rapid rotatory motion, the large silver medal.

— J. Robison, Esq. Sec. R. S. Edin., Athol-place, Edin., for his experiments on the best form for canal boats, the large silver medal.

— Mr. W. Ward, Maria-street, Kingsland-road, for his bedstead for the use of invalids, the silver Isis medal.

— Mr. E. Ward, Bedford, for his tourniquet, the silver Isis medal, and 5l.

— Mr. W. Hutchinson, Sheffield, for his hare-lip forceps, the large silver medal.

- To Lord John Hay, Capt. R. N., for a telescope holder for the use of a person with only one hand, the large silver medal.
- Mr. Wicks, Stockwell, for a fire-escape, the silver Isis medal.
 - Mr. Geo. Henekey, Grove-end-road, St. John's-wood, for an apparatus for drawing water from the surface, the silver Isis medal.
 - Mr. J. Rofo, Jun. 11, Bernard-street, Russell-square, for his hydraulic blow-pipe, the large silver medal.
 - Mr. W. Pybus, Smithson-street, Gray's Inn-road, for his improved drill stock, the silver Isis medal.
 - Mr. G. Farrow, Silver-street, Golden-square, for his machine for silvering looking-glasses, the large silver medal and 5*l*.
 - Mr. W. Rogers, 54, High-street, St. Giles's, for his machine for parting combs, the large silver medal.
 - Mr. Geo. Edwards, Lowestoff-harbour works, for his rod for taking soundings, the large silver medal.
 - Mr. Michael Staunton, Craven-street, Strand, for his cutting-press for stationers, the large silver medal.
 - Mr. J. Wilson Neil, 21, Battle-bridge, for his communication on the preparation of varnishes, the gold Isis medal.
 - Mr. J. Williams, School-house, Spitalfields, for his method of taking copies of inscriptions, &c. from engraved stones, the silver Isis medal.
 - Mr. James Hopkins, 10, Caroline-street, Bedford-square, for his scales for obtaining geometrical foreshortened lines in architectural drawings, the silver Isis medal.
 - Mr. W. Flight, King William-street, for an instrument for drawing spirals, the silver Isis medal.
 - Mr. J. Hammond Jones, 59, Greek-street, Soho, for a fluid for the use of painters in miniature, the silver Isis medal.
 - Miss Eliza Manning, 17, Newman-street, for a model of a bust from the life, the large silver medal.
 - Miss S. Jane Benson, North Cray-place, Kent, for a drawing in pencil of a landscape from nature, the silver Isis medal.
 - Mr. S. George Hayes, 17, Myddleton-street, Spa-fields, for an outline anatomical drawing from a cast, the large silver medal.
 - Mr. H. E. Kendall, Jun., 17, Suffolk-street, Pall-mall East, for an original drawing of architectural foliage, the silver Isis medal.
 - Mr. J. W. Hance, 11, Montpellier-square, Brompton, for an original design for the interior of a picture gallery, the large silver medal.
 - Mr. W. Barnes, Mercer's-hall, Cheapside, for an original design for a triumphal bridge, the large silver medal.
 - Mr. Ed. Ellis, 36, Fenchurch-street, for a copy in water-colours of the tinterior of St Peter's at Rome, the silver palette.

- To Mr. J. Peake, 46, Clarendon-street, Somers-town, for a copy in Indian ink of a Corinthian capital, the large silver medal.
- Mr. R. W. Billings, 65, Clarence-garden, Regent's-park, for an original perspective drawing of the interior of Covent-garden theatre, the silver Isis medal.
- Mr. Ed. Turnerelli, 62, Newman-street, for a finished drawing from a bust, the large silver medal.
- Mr. F. T. Baynes, 41, Burton-street, Burton-crescent, for an original group of portraits in miniature, the silver Isis medal.
- Mr. C. Camille Langlois, jun. 31, Burton-crescent, for an original portrait in oil, the gold Isis medal.
- Mr. J. Lilley, 3, Warren-street, Fitzroy-square, for an original portrait in oil, the large silver medal.
- Mr. Samuel Manning, jun. 17, Newman-street, for an original model of a figure, the gold Isis medal.
- Mr. Fred. Calvert, 21, Lambeth-road, Southwark, for an original marine painting in oil, the large silver medal.
- Mr. Alexander Crabb, Hill-street, Peckham, for an original composition in oil of fruit, the gold Isis medal.
- Mr. Ed. Baillie, 7, Henry-street, Cumberland Haymarket, Regent's Park, for an original enamel painting of a head, the large silver medal.

The Thanks of the Society have been voted to

- Mr. J. Bedford, of Leeds, for his method of preventing the calcareous deposit from hard water from adhering to the inside of steam-boilers.
- Mr. J. Baynes, of Blackman-street, Southwark, for his method of supplying a dye-house with hot water.
- Mr. W. Ward, Maria-street, Kingsland-road, for a proposed method of communicating between a stranded ship and the shore.
- Mr. James Heard, Blackheath, for his description of a wooden road at Petersburg.
- Mr. J. Holland, Manor-place, Walworth, for his improved shade for the lamp of a microscope.
- Capt. T. M. Bagnold, R.N. High-row, Knightsbridge, for his communication respecting the algarroba of Chili, and samples of its pods.
- Mr. C. Smythies, 39, Essex-street, for his comparative experiments on cultivating potatoes and turnips.
- T. Smith, Esq. of Leith, for his paper on the dry-rot of timber.
- J. Reeves, Esq. Clapham, for his Notices from Chinese documents of the method of making paper in China.
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List of Patents

*Granted in Scotland, from 8th January to
13th March, 1833.*

To William Gutteridge, of the Minories, in the borough of the Tower Hamlets, civil engineer, and George Stevens, of Norwood, in the county of Surrey, sugar refiner, for an invention of apparatus for the manufacture and refining of sugar and other extracts, and applicable also to other purposes.—6th Jan.

To Charles Watt, of Clapham, in the county of Surrey, for an invention of a new or improved method or process of preparing tallow and stuff from fatty materials, and refining the same for the manufacture of candles and other purposes.—22nd Jan.

To Thomas Parsons, the younger, of Furnival's Inn, in the county of Middlesex, gentleman, for an invention of certain improvements in locks for doors and other purposes.—7th Feb.

To Joshua Wordsworth, of Leeds, in the county of York, machine maker, for the invention of certain improvements in machinery for preparing, drawing, roving, and spinning flax, hemp, wool, and other fibrous materials.—16th Feb.

To Sir Charles Webb Dance, of Hertsbourne Manor Place, in the county of Hertford, Knight, Lieutenant Colonel, for an invention of certain improvements in steam boilers.—21st Feb.

To Joseph Saxton, of Sussex-street, in the county of Middlesex, mechanic, for an invention of improvements in propelling carriages, and in propelling vessels for inland navigation.—21st Feb.

To William Lloyd Warton, of Dryburn, in the county of Durham, Esq. for an invention of certain improvements

in steam engines for raising or forcing water.—21st Feb.

To John Reynolds, of Oakwood, near Neath, in the county of Glamorgan, iron master, for an invention of certain improvements in steam or other engines.—21st Feb.

To Jonathan Dickson and James Ikin, both of Holland-street, Blackfriars-road, in the county of Surrey, engineers, for an invention of improvements in the process of making gas from coal or other substances.—March 11.

To Richard Badnall, the younger, formerly of Ashenhurst Hall, near Leek, in the county of Suffolk, now residing in the town of Douglas, in the Isle of Man, gentleman, for an invention of certain improvements in the construction or formation of the trams or rails, or lines of rails or tram roads, upon which locomotive engines shall or may be worked, or may be employed.—11th March.

To John M'Curdy, of Southampton-row, in the county of Middlesex, Esq., in consequence partly of a communication by a certain foreigner residing abroad, for an invention of certain improvements in machinery for acquiring power in rivers and currents.—11th March.

To Richard Trevethick, of Lambourne, in the county of Cornwall, engineer, for an invention of an improvement or improvements on the steam engine, and the application of steam power to navigation and locomotion.—11th March.

To William Thomas Shallcross, of Holt Town, within the parish of Manchester, in the county palatine of Lancaster, mechanic, for an invention of certain improvements in looms or machines for weaving cotton, linen, silk, woollen, and other fibrous cloths and substances.—13th March.

New Patents**SEALED IN ENGLAND.****1833.**

To Jonathan Hayne, of the parish of Saint James, Clerkenwell, in the county of Middlesex, silversmith, for certain improvements in the mode or method of making or manufacturing metal spoons, and other articles.—Sealed May 25th—6 months for enrolment of Specification.

To Robert Beart, of Godmanchester, in the county of Huntingdon, miller, for certain improvements in making or producing tiles for draining land, buildings, and other purposes.—Sealed May 25th—6 months for enrolment.

To James Jones, of Salford, within the parish of Manchester, in the county palatine of Lancaster, machine maker, for certain improvements in the making of rovings, spinning, and doubling of cotton, silk, flax, and other fibrous substances.—Sealed May 25th—6 months for enrolment.

To Francis Molineux, of New Bridge-street, Black friars, gentleman, for certain improvements in machinery or apparatus for making paper.—Sealed May 25th—6 months for enrolment.

To George Harris, of East Dulwich, in the county of Surrey, Esquire, for a method of reducing and preparing various vegetable substances (not hitherto in use for the like purpose), and for the manufacturing them into articles

in general use, heretofore usually made from hemp and flax.—Sealed June 1st—6 months for inrolment.

To John Burton, of Goswell Road, in the county of Middlesex, engineer, for improvements in the construction and application of pumps and machinery, for raising fluids and other purposes.—Sealed June 1st—6 months for inrolment.

To George Carter, of Nottingham Lodge, in the county of Kent, gentleman, for certain improvements in paddle wheels.—Sealed June 1st—6 months for inrolment.

To Pierre Antoine Angilbert, of Upper Charles-street, Northampton-square, in the county of Middlesex, gentleman, for his invention of certain improvements in preserving animal and vegetable substances.—Sealed June 1st—6 months for inrolment.

To Charles Madeley, of Gibson Hall, in the parish of Coleshill, in the county of Warwick, farmer, for his invention of a scarifier or harrow.—Sealed June 1st—2 months for inrolment.

To William Jessop, of Butterley Hall, in the county of Derby, Esquire, for improvements in constructing railways, —Sealed June 1st—6 months for inrolment.

To Charles Jones, of Birmingham, gun maker, for a new arrangement of additions to, and alterations in, certain parts of gun and pistol locks.—Sealed June 12th—6 months for inrolment.

To James Caldwell, of the New Crane, Shadwell, in the county of Middlesex, coal merchant, for certain improvements in cranes, vessels, and apparatus for delivering coals from shipping to wharfs, warehouses, waggons, or

carts, without the employment of lighters as usual, and the whole or parts of which said improvements are also applicable to other purposes.—Sealed June 12th—6 months for inrolment.

To Thomas Wrigley, of Bridge Hall Mills, near Bury, in the county of Lancaster, paper maker, for an improved pulp strainer, to be used in making paper.—Sealed June 20th—6 months for inrolment.

To Joseph Gibbs, of East Smithfield, in the county of Middlesex, engineer, and Augustus Applegath, of Crayford, in the county of Kent, calico printer, for their invention of certain improvements in the construction of rail roads, bridges, piers, jetties, and aqueducts, parts of which may be applied to other useful purposes.—Sealed June 20th—6 months for inrolment.

To Andrew Ure, of Charlotte-street, in the parish of Saint George, Bloomsbury, in the county of Middlesex, doctor of medicine, for an improved apparatus for evaporating syrups and saccharine juices, which is also applicable to other purposes.—Sealed June 20th—6 months for inrolment.

To William Newton, of the Office for Patent Inventions, Chancery Lane, in the parish of Saint Andrew, Holborn, in the county of Middlesex, civil engineer, for an improved apparatus for boiling, evaporating, and concentrating syrups for the production of sugar, and also of saline liquors, or for the crystallization of salt; which apparatus may also be employed in the process of distillation, being a communication made to him by a foreigner.—Sealed June 20th—6 months for inrolment.

CELESTIAL PHENOMENA, FOR JULY, 1833.

D.	H.	M.		D.	H.	M.	
1	0	0	Clock after the Sun 3 m. 24 s.	15	0	0	☾ passes the meridian 23 h. 11 m.
—	—	—	Sun rises 3 h. 49 m. sets 8 h. 18.	17	0	0	☉ Eclipsed visible, see note.
—	—	—	Moon rises 8 h. 3 m. p. m. sets 3 h. 13 m. A. M.	17	7	10	Ecliptic conj. or ☉ new moon.
—	—	—	Moon passes the meridian 12 h. 40 m.	18	3	0	☾ in Perige.
—	—	—	Moon eclipsed visible see note	18	14	12	Jupiter's first sat. will im.
0	12	18	Ecliptic opposition or ☉ full moon.	18	15	24	☾ in conj. with ♄ long. 23. in Can. ☾ lat. 3. 8. N. ♄ lat. 13. diff. of lat. 2. 55.
0	18	0	☉ in Apogee.	19	3	40	☾ in conj. with ♄ long. 5. Leo. ☾ lat. 3. 41. N. ♄ lat. 1. 5. N. diff. of lat. 2. 36.
0	22	0	☿ in Aphelio.				Half Axes } 38. 20. Jupiter's ring } 0. 82.
4	14	38	Jupiter's third sat. will emerge	20	0	0	Clock before the sun 5 m. 58 s.
5	0	0	Clock before the ☉ 4 m. 8 s.	—	—	—	☉ rises 4 h. 8 m. sets 8 h. 3 m.
—	—	—	☉ rises 3 h. 52 m. sets 8 h. 16 m.	—	—	—	☾ rises 8 h. 1 m. A. M. sets 10 h. 14 m. P. M.
—	—	—	☾ rises 10 h. 33 m. P. M. sets 7 h. 0 m. A. M.	—	—	—	☾ passes the mer. 3 h. 10 m.
—	—	—	☾ passes mer. 15 h. 11 m.	—	—	—	Mer. R. A. 9 h. 45 m. dec. 18. 28. N.
0	22	0	☾ in Apogee.	—	—	—	Venus R. A. 4 h. 44 m. dec. 18. 34. N.
6	0	0	Mer. R. A. 8 h. 25 m. dec. 21. 0. N.	—	—	—	Mars R. A. 10 h. 14 m. dec. 12. 5. N.
—	—	—	Ven. R. A. 3 h. 56 m. dec. 16. 25. N.	—	—	—	Jupiter R. A. 2 h. 7 m. dec. 11. 31. N.
—	—	—	Mars R. A. 9 h. 41 m. dec. 15. 8. N.	—	—	—	Saturn R. A. 11 h. 41 m. dec. 4. 25. N.
—	—	—	Jup. R. A. 2 h. 0 m. dec. 10. 5. N.	—	—	—	Georg. R. A. 21 h. 37 m. dec. 15. 3. S.
—	—	—	Sat. R. A. 11 h. 37 m. dec. 4. 53 N.	—	—	—	Vesta R. A. 18 h. 48 m. dec. 4. 11. S.
—	—	—	Georg. R. A. 21 h. 38 m. dec. 14. 54. S.	—	—	—	Juno R. A. 14 h. 43 m. dec. 1. 51. S.
—	—	—	Vesta R. A. 19 h. 2. m. dec. 22. 53. S.	—	—	—	Pallas R. A. 5 h. 24 m. dec. 2. 8. S.
—	—	—	Juno R. A. 14 h. 42 m. dec. 1. 0 S.	—	—	—	Ceres R. A. 6 h. 51 m. dec. 24. 57. N.
—	—	—	Pallas R. A. 4 h. 56 m. dec. 1. 30. S.	20	13	16	Jupiter's second sat. will im.
—	—	—	Ceres R. A. 6 h. 24 m. dec. 24. 53. N.	23	9	34	☾ in ☐ or first quarter.
10	0	0	Clock before the Sun 4 m. 55 s.	25	0	0	Clock before the sun 6 m. 9 s.
—	—	—	☉ rises 3 h. 56 m. sets 8 h. 13 m.	—	—	—	☉ rises 4 h. 15 m. sets 7 h. 57 m.
—	—	—	☾ passes the mer. 18 h. 44 m.	—	—	—	☾ rises 2 h. 35 m. P. M. sets midnight.
10	4	7	☾ in ☐ or last quarter.	—	—	—	☾ passes the meridian 7 h. 20 m.
10	20	44	☾ in conj. with ♃ long. 28. in Aires. ☾ lat. 5. 8. S. ♃ lat. 1. 14. S. diff. of lat. 3. 64.	26	0	0	☉ Elong. max. E. 27. 9.
13	10	26	☾ in conj. with ♄ long. 7. Taurus. ☾ lat. 3. 15. S. ♄ lat. 3. 52. N. diff. of lat. 37.	—	—	—	☉ Elong. max. W. 45. 45.
15	0	0	Clock before the sun 5 m. 33 s.	27	0	0	☉ and ♄ in quadrature
—	—	—	☉ rises 4 h. 2 m. sets 8 h. 9 m.	27	13	27	Jupiter's second sat. will im.
—	—	—	☾ rises 2 h. 4 m. A. M. sets 6 h. 35 m. P. M.	29	12	0	☿ in aphelio.
				31	3	1	Ecliptic oppos. or ☉ full moon.

THE HURRICANE.

Hurricane.—On the 11th we were visited by a more violent storm of wind than has perhaps ever before occurred in this part of the country in the summer season, certainly never remembered in the month of June. At sun rise the atmosphere was calm and cloudless, and so continued till near seven, when the clouds rose, and the wind blew in gusts, which carried away leaves and fruit of all trees exposed to its force; the storm, however, was not at its height till noon, from which time, till near five, it blew with such terrific force, that many lofty elms and oaks were torn up by the roots, and thrown upon the ground. In several gardens the trees have lost more than half their fruit. The appearance of the leaves is that of having been parched by heat, arising, however, merely from the violent concussion. Haymaking, which had been in most cases deferred till the 10th, in hopes of rain, was a complete scene of confusion; any attempt to keep it together in the open field was fruitless, and in some cases the meadow parted with its grass, to cover a field of potatoes; while in other cases, where adjoining fields have been the property of more than one, it has led to strange controversies as to how much the neighbour's field may have been benefitted by the gust of wind.

Edmonton.

C. H. ADAMS.

ECLIPSES.

July 1st —An eclipse of the moon, visible at Greenwich.

	H.	M.
Beginning	11	11½
Ecliptic opposition	12	33
Middle	12	39½
End	14	17½

Digits eclipsed 10. 18. from the northern side of the ☾'s shadow, or on the southern limb of the ☾

July 10th —A large eclipse of the sun, visible at Greenwich.

Beginning	16	58
Greatest obscuration	17	49½
Middle	17	50½
Visible conjunction	17	52½
End	18	43½

Digits eclipsed 8. 50. on the ☉ northern limb.

J. LEWTHWAITE.

METEOROLOGICAL JOURNAL,

FOR MAY AND JUNE 1893.

1893.	Thermo.		Barometer.		Rain in in- ches.	1893.	Thermo.		Barometer.		Rain in in- ches.
	Hig.	Low	Hig.	Low.			Hig.	Low	Hig.	Low.	
May.						May.					
26	65	41	30,11	30,03		11	64	41	29,72	29,64	
27	67	40	30,23	30,18		12	64	41	29,74	29,69	
28	71	40	30,15	30,11		13	57	40	29,61	29,53	
29	67	39	30,11	Staty.		14	61	39	29,50	Staty.	,275
30	69	40	30,24	30,18		15	67	39	29,58	29,52	
31	70	37	30,28	Staty.		16	70	36	29,68	29,64	,1
June.											
1	77	40	30,18	30,05		17	67	37	29,83	29,76	,125
2	75	46	29,96	29,57		18	70	46	30,04	30,01	,05
3	67	46	29,53	29,51		19	68	46	29,95	29,90	
4	63	40	29,59	29,56		20	68	45	29,86	Staty.	
5	70	39	29,70	29,64		21	71	39	29,92	29,87	
6	71	41	29,86	29,76		22	68	41	29,92	29,81	
7	70	39	29,99	29,92		23	62	39	29,58	29,47	,225
8	73	41	30,18	30,04		24	61	43	29,69	29,54	,25
9	75	40	30,24	30,19		25	64	40	29,85	29,76	,025
10	78	40	30,24	30,19							

Edmonton,

CHARLES HENRY ADAMS.

Latitude 51° 37' 32" N.

Longitude 3 51 West of Greenwich.

